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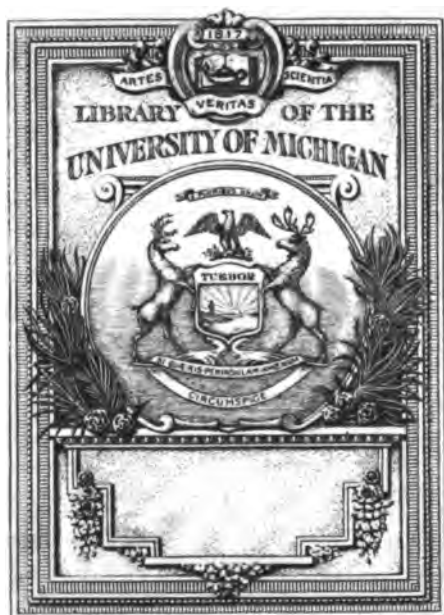
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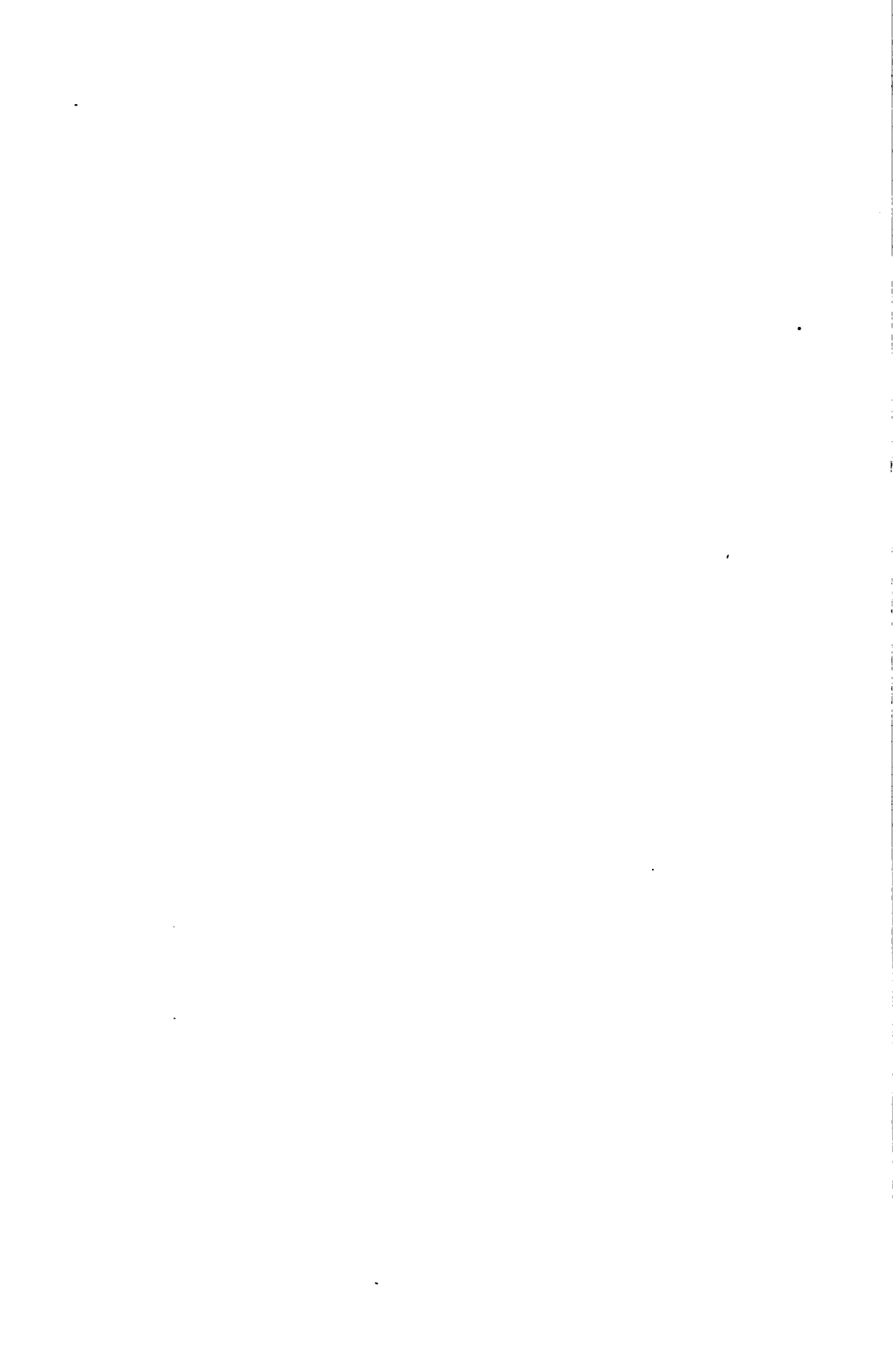
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DEPARTMENT OF RESEARCH

THE INTELLIGENCE OF THE FEEBLE-MINDED

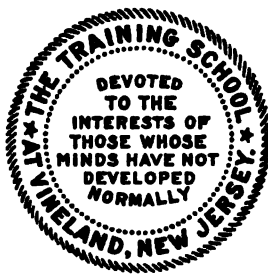
BY

ALFRED BINET, Sc.D. AND TH. SIMON, M.D.

TRANSLATED BY

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Paris le 23 juillet, 1905
Member of the Staff of the Vineland
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INTRODUCTION

It is with peculiar pleasure that the Vineland Research Department presents to the public Miss Kite's translation of Binet and Simon's work entitled *The Intelligence of the Feeble-Minded*.

Nowhere does Binet's genius show more brilliantly than in this work. That he in the midst of a busy life and in addition to all his other work could have acquired so great a knowledge of mental defectives is amazing; the more so when we realize that it was first-hand knowledge gained from observation backed by keen perception, that perception that enabled him to see the truth with a quickness that makes the rest of us, still groping in the dark, question if it was truth Binet saw. But that it was truth we are learning every day. After ten years of the Vineland laboratory it is surprising to find how little we have found that Binet had not already discovered. It is true we have found it independently and so it is confirmatory evidence.

It is because our own experience has led us to the same conclusions, wherever we have studied the same points, that we have come to have such a profound regard for Binet that we feel like pronouncing this the most important and enlightening work on the real nature of the mental defective, that has ever appeared.

The study of the language of the feeble-minded will also be found most illuminating in a region usually characterized by darkness.

Finally the discussion of feeble-mindedness and dementia is quite as timely and enlightening as the rest.

We have included these various articles in this volume for two reasons: first, because they all contribute to our knowledge of the feeble-minded; and second, they all give us further illustration of the way Binet used his own Measuring Scale.

A word might be said in reference to the title. Binet and Simon's title for the first and longest section is "*L'Intelligence des Imbéciles*" literally "The Intelligence of the Imbeciles" but they definitely state (page 10) that they refer to the entire group of subnormals. Hence, while "Imbeciles" is still the legal word, we

have preferred to use the more popular generic term, Feeble-Minded, as on the whole better expressing the meaning of the authors and conveying a clearer idea of the scope of the work.

It was originally intended to publish this volume and *The Development of the Intelligence in Children* as one, hence all that was said there of the faithful work of the various members of the Research Department should be repeated here. Miss Kite's translation will speak for itself.

Biographical Note. No one will read these volumes without desiring to know something of the distinguished authors.

Alfred Binet was born in Nice, July 11, 1857. His mother was an artist; his father a physician.

Binet went early to Paris and studied first law then medicine. He worked in the biological laboratory of the noted Balbiani. But he was strongly drawn toward Experimental Psychology. In 1889 he created at the Sorbonne the first Psychological Laboratory in France.

He was remarkably versatile and worked and wrote in many fields.

He was an indefatigable worker, but he worked easily and always with that keen insight which enabled him to see quickly the significance of his facts, so that little energy was wasted on useless hypotheses.

He died in Paris, October 18, 1911, from an acute attack of cerebral apoplexy.

Dr. Th. Simon was born at Dijon, July 10, 1873. He took his degree in medicine in Paris. His thesis received Honorable Mention.

Since 1908, he has been physician at the Hospital for the Insane at Saint-Yon.

After the death of Binet Dr. Simon was made President of the Society for the Psychological Study of the Child.

HENRY H. GODDARD,
Editor.

PART I

The Intelligence of the Feeble-Minded

THE INTELLIGENCE OF THE FEEBLE-MINDED

PRELIMINARIES

Numerous investigations, especially in France, directed toward pathological psychology, have exercised such an influence upon philosophers that some of them have come to consider mental pathology as the best means of psychological analysis—which is true; but they have even gone so far as to believe that it is by pathology alone that the normal can be understood—something infinitely less probable. We need nothing further as proof of this prejudice than the fortune which has attended that expression *Mental Synthesis* (*synthèse mentale*) which is today so wide spread that it has come to be the center of the explanation of all mental states, and which evidently originated in the observation of patients deprived of this synthesis. It results from this that the notion of *co-ordination*, and that of *hierarchy*, which are the analyzed elements of the idea of synthesis, have entered into the plan of all the theories.

We have not the slightest intention of objecting to the truth of these conclusions, but only to their exaggeration: they seem to us very limited, and cannot in our opinion embrace the immense domain of the pathology of mind; and the studies which serve as a basis for them have neglected a great number of "*malades mentaux*," who, we believe, do not suffer at all from a lack of mental synthesis. In a word, we think that mental pathology contains, as subjects worthy of study, not simply hysterics, neurasthenics, psychasthenics, etc., those examples typical of disintegration, but types wholly different; for example, those of backward intelligence, and the diverse categories of dementia. If we add the two latter classes to that of the disintegrated, we shall certainly arrive at a very much broader view of mental pathology.

This is precisely the work which we have undertaken; and let us say at once, in order to clear our path in advance, we have

come to the conclusion that the particular psychological modification which constitutes "*un aliéné*," has at least three fundamental causes (without prejudice to other mechanisms, which are unknown to us, or rather of which we have only a presentiment).

1. An alteration of *mental synthesis*—we shall not speak of this.
2. A defect, an arrest, or an insufficiency of *intellectual development*.
3. A defect, an arrest, or an insufficiency of *intellectual functioning*.

To the study of these last two mechanisms, two distinct articles will be devoted, one upon Imbeciles, the other upon Demented.

This article will deal only with the intelligence of imbeciles, or rather, taking in our title the species for the genus, we shall set forth what is peculiar to the intelligence of all types of defectives. There is in particular, as everyone knows, a lack of development; and apropos of this we shall present a new method of psychology, which may be called *psychogenetics*. For it will suffice for us to put into a series, in the order of the development of their intelligence, a certain number of these backward subjects, and to study throughout this series a particular phenomenon; for example, the sense of pain or the attention, to see what are the necessary stages of development which this phenomenon presents, and how it evolves. Looked at from this psychological point of view, the study of the imbecile approaches that of the normal child and even of animals. We find here a means of renewing, developing, and perfecting our former investigations upon children. This comparing of a backward intelligence to that of a child of a certain age, might have passed ten years ago as simple literary comparison; but since today we have acquired the power to fix within a few months at least the *age of the intelligence* of defectives,¹ since we can with good reason consider a certain idiot of thirty years as the equivalent of a child of one, or an imbecile of twenty as the equivalent of a child of six, and since these defectives are so many children arrested in a certain phase of their development, we have only to arrange these defectives in an ascending series of evolution, in order to make with it and because of it, the psychogenesis of a function.

¹ See our preceding article upon "The Development of the Intelligence Among Children" (p. 108).

The critics of tomorrow, who surely will not fail to appear, will teach us what must be corrected and gone over in our plan of studies; for the sources of error, little by little, will have been disclosed. That is a secondary work. But first it must be demonstrated, and this is what we are going to attempt, that the new method to which we are calling attention really exists; and that to make this demonstration, nothing is simpler than to put it in operation. We shall therefore trace, by means of a study of imbeciles, the mental evolution of the following phenomena: character, attention, effort, motor ability and writing, the intelligence of perception, the sense of pain, association of ideas, intellectual activity, the arithmetical faculty, reasoning, suggestibility and docility, and how an imbecile may have "*l'esprit faux*."

Afterwards, leaving the details, or rather by synthesizing them, we shall try to discover exactly in what mental development consists, by what mechanism it is produced, and how a superior intelligence differs from an inferior one. Apropos of this we shall be led to describe a new scheme of thought in order to understand thoroughly the manner in which it develops.

I. CHARACTER—THE REBELLIOUS AND THE DOCILE

A question very little studied, vague and difficult to state, is that of the relation which exists between character and intellectual development. This relation has been the subject of some thought and has been examined from various points of view. Thus, it has been asked if character changes with age, or if on the contrary the adult is not altogether in the child. It is very possible that the instinctive part of the child is conserved in the adult, but better directed by reason, and especially better suppressed in the presence of others. It has been asked if, among individuals of superior intelligence, the character, like the rest, does not undergo an ascending evolution, and if men of genius are not also geniuses in character. But in whatever fashion this vague proposition be understood, it is very doubtful if it be true. Too many examples have demonstrated to us that the most splendid geniuses can be the sorriest characters. In short the relation between character and intelligence, in spite of the attention it has received, remains very little known and very poorly formulated.

We shall not here treat this subject fully; certain material conditions have hindered us; it is not the imbecile in a hospital, it is the imbecile in his family or in a family colony that one must know. We have seen our subjects only in the unnatural surroundings of a hospital, or worse in the narrow limits of our office, where we had called them; seated near a table, replying to questions, talking, or submitting to different tests, they were somewhat like students at an examination. A professor would form a very narrow view of the youth of his time, if he saw them only during an examination. We resemble somewhat such a professor.

It is therefore essential to commence by limiting our subject of study in remarking that we have not in view that sum total of phenomena which constitutes character, but the manifestations of character which were brought out by our personality. Let us say more simply that our attention has been directed toward

the docile or hostile dispositions which imbeciles have assumed in relation to us and we have tried to discover if their dispositions bear any relation to their intellectual levels. Are the rebellious ones the idiots and the docile ones the imbeciles? Or again are there more rebellious ones among the idiots, and more docile ones among the imbeciles? We do not think so. We shall show by some very clear examples that both these forms of character are to be found in all the degrees of deficiency.



FIG. 1. VOUZIN, IDIOT, TWENTY YEARS OLD, MUTE FROM LACK OF INTELLIGENCE; HE IS BELOW THE LEVEL OF A CHILD OF TWO YEARS.

THE CHARACTER OF IDIOTS

Let us start at once with illustrations, or rather let us sketch a portrait.

Vouzin is a young man of twenty-seven years, whose external appearance is not marred by any apparent physical stigmata. He is small; his face is beardless, child-like, without a wrinkle; the expression is sweet and at first sight does not seem abnormal.

The portrait which we give of him (fig. 1) is made from a snapshot; the wrinkles of his forehead are due to blinking caused by the direct light of the sun. This must be taken into account. The portrait is of value only as it represents the regularity of his features. On the other hand Vouzin has a number of tics, which are like so many stigmata added to a normal anatomy. He almost constantly emits guttural sounds; he moves a quantity of saliva about in his mouth; when seated, he sways his body backwards and forwards; frequently he looks at the ends of his fingers with flitting attention. All these tics seem to us explainable in part in the same way as those of certain blind persons; they are motor tendencies which might arise, under very exceptional conditions, among normals; but normals arrest and suppress them. The blind do not succeed in suppressing them, because they do not see them, and are therefore unconscious of their existence. Thus a blind musician shows an expression of suffering when he is executing a difficult passage. The idiot does not suppress these tics for various reasons. In the first place, although being able to perceive them, he has not enough intelligence to realize that such actions are not proper. Again, certain tics are probably uncontrollable. Finally the number of tics and their peculiarities are the expression of a particular condition of the nervous system.

We photographed Vouzin in an enclosure surrounded by a wooden paling; this had for us almost a symbolic value, our idiot being confined like an animal in the zoological garden. Almost in spite of ourselves we compare him to an animal whose training has just commenced. If you call him he comes; if he is in the house, he runs whenever a door is opened; he presents himself at the door to see who is entering, showing us the naïve curiosity of an animal. If one says "good day" to him, holding out the hand, he does not reply verbally, for he does not know how to speak, but he understands the significance of the extended hand; he gives you a finger, only one, which would be, in another, a lack of culture or intended disdain, but is only awkwardness in him. If an object is presented to him, sometimes he does not take it, sometimes on the contrary he seizes it with an awkward gesture; he holds his hand flat, with the fingers close together. One would say that he was expecting to receive a penny in the palm of his hand. At other times he does not use his hands or arms, which

he allows to hang awkwardly at his side; if food is offered, he thrusts his mouth forward to seize it reminding one of an animal.

Figure 2 represents him in one of these attitudes. Vouzin did not take this pose in response to a command, but spontaneously. Furthermore, he does not understand a verbal order so complicated as this. His prehension is extremely defective; if an object is presented to him, he holds it in his hand; if a second is offered



FIG. 2. ONE PRESENTS A BISCUIT TO THE IDIOT VOUZIN, WHO INSTEAD OF TAKING IT WITH HIS HAND, PUTS FORWARD HIS MOUTH AND TAKES IT ANIMAL FASHION.

he takes it without letting go the first. A third object is received in the same way and so on and on, without his ever having the idea of ridding himself of them by depositing the objects on a table.

Vouzin is obedient. If an order is given him by gestures, he can execute it. When he is seated, he understands the gesture which orders him to stand up; when he is standing if we show him a chair and invite him to be seated, he understands and seats

himself abruptly, folding his legs under the chair with an awkward movement.

If Vouzin's cap is taken off his head and he is told to go and hunt it, he does so without remonstrance, finds his cap and puts it on his head. We repeat the same play a dozen times. In the end, Vouzin shows a timid resistance; he leans his head away from us to save his cap; but he does not defend himself with his



FIG. 3. CRETIN, YOUNG IMBECILE OF MIDDLE GRADE, OF SEVENTEEN YEARS. SHE CAN TELL HER NAME, SEX, POINT TO HER NOSE, BUT CANNOT COMPARE TWO WEIGHTS, COPY A SQUARE NOR COUNT FOUR SOUS. CHARACTER REBELLIOUS. INTELLECTUAL LEVEL FOUR YEARS.

hands nor does he get up to go away from us. If his cap is hidden before his eyes under a pile of books, he will go and get it. We placed his cap upon the horizontal bar of a measuring rod. He refused to go and take it and shook his head as a sign of negation. Was he afraid? It is possible. In any case, at last he rebelled. But he is far from rebellious in the same way as little M——, a turbulent young idiot, six years of age whom a

skin disease has left completely bald. She enters our office without looking at us and walks up and down grinding her teeth. We draw near to her and hand her a biscuit. She takes it with a quick movement, and throws it on the ground. Many other objects offered to her have the same fate; they are taken, then thrown forcibly to the ground. The child in doing this does not express any anger. Furthermore her face remains totally inexpressive. She spends her time putting her hands in her mouth and grinding her teeth. We try to awaken some feeling in her, and we put our fist under her nose, but she does not seem to understand this mimicry, at all events she remains impassive. We follow her into the room. She goes hap-hazard, seats herself in a corner and fixes upon us a voluntary gaze; then seeing a chair in front of her she turns it over without saying a word. A little farther on she encounters an apron placed upon a chair; she takes the apron and throws it on the ground. She next finds a basket containing a biscuit; she takes the biscuit and throws it away; one is obliged to watch her to prevent her from destroying fragile objects.

Thus here are two idiots one of whom is gentle enough, while the other is a disagreeable example of a rebellious subject.

CHARACTERS OF IMBECILES AND MORONS

There are the same distinctions in imbeciles and morons; there are imbeciles who are docile, who execute the orders given to them and from whom we obtain their best in the diverse experiments to which we subject them; and there are others who submit to nothing, who are rebellious, and who do not wish to execute any of our orders, and who out of ill-will reply, "I do not know," to all our questions. One must be well aware of the existence of these two types of character and their psychological significance.

Let us cite several examples which will show the great variety of characters that may be included under the same term. Among the rebellious we note Cretin, an imbecile of twenty who has the fierce air of an untamed animal, who is always on the defensive, distrusts us, is afraid of us, and at every moment wishes to get away. When she rises it is almost impossible to make her sit down again. Beauvisage, another imbecile of twenty,

but of a somewhat higher degree than the other (middle grade imbecile), shows very much the same savage, timid character; she is nevertheless rather less surly, and is more easily made to weep. When the measurement of her head was to be taken, she became alarmed, refused to come, beginning to cry; it finally required two sous to make her decide to submit to this harmless operation. Duguet, another imbecile woman of the same men-



FIG. 4. BEAUVISAGE, YOUNG IMBECILE OF HIGH GRADE, AGED TWENTY YEARS. SHE CAN COUNT FOUR SOUS, COMPARE TWO WEIGHTS, DO THREE ERRANDS, ETC. INTELLECTUAL LEVEL OF SIX YEARS.

tal level as Beauvisage, and older than she, evinced no emotion that could properly be called fear. She smiled constantly, a simpering sort of smile, and when asked to do the easiest test invariably replied, "Don't know," then began to laugh, plunging her head into her arms. Nevertheless she would generally be able to reply if she made the slightest effort. Another example is Galiard, a moron, who suffers from attacks of epilepsy and

who, after one of these attacks, completely changed her attitude towards us. In the beginning she seemed eager and full of interest in spite of a little intellectual apathy. But after her attacks her character changed; she is taciturn, disagreeable, scarcely replying to our questions, and then only in monosyllables, and when we insist, she pretends to be looking elsewhere.

Here is still another example, but of a very different sort; Larazé, a young girl of fourteen, who is almost normal as regards



FIG. 5. LARAZÉ, YOUNG GIRL OF FOURTEEN, NORMAL INTELLIGENCE, BUT UNSTABLE.

intelligence, but who has been confined because of "*perversion des instincts*." She is a singular person, with no apparent intellectual deficiency. She is quick of speech, makes sensible replies, in marked contrast with the mute stupidity of our habitual defectives. She responds to all our little attempts, she is therefore not rebellious in the proper sense of the word. Nevertheless she is of a peculiar character, as we can see from her his-

tory outside of the institution. She has been in thirty-six places, leaving each time impulsively and finally she was imprisoned at F—— for an escapade about which she does not care to talk. In the institution she is noisy, and in the way; with us she is far too familiar and says anything that passes through her head. One day when we had made her believe that she could not so



FIG. 6. PROFILE OF LARAZÉ.

quickly get away, she became over-excited. "I am going to write to Judge M. X—— to let me have my liberty, and if he doesn't give it to me I will do him harm, or I will kill myself, but I'll harm him first. Rather than live in misery like they make me live here I'll break everything, I'll pick up anything I can lay hands on, to strike him in the mouth. Give me paper

so I can write to him." It required the greatest effort to calm her and to prove to her that saying such stupid things to the judge would be a very poor way to obtain her freedom. She seems at such moments, incapable of reasoning. It is an intelligence which does not resist emotional stress, she is like a compass which the storm has turned so that it no longer points true; it is here in these disorders of intelligence produced by frequent emotions that we must look for a definition of the state known under the name of *mental instability*.

It can thus be seen from this simple enumeration through how many shades the rebellious character passes. In regard to this it is curious and even important to remark that the resistance of subjects to the tests does not show itself with the same violence for all. There are certain ones which they always refuse to do, and others to which they submit more willingly. In this they resemble normals. A normal, ordinarily very unwilling, submits to any test which appeals to his vanity. There are many who consent to read out loud but who are not willing to sing, etc. With imbeciles, we have noticed the following facts: the most rebellious do not in general refuse to do the tests which require no effort, like naming a color or a piece of money; they do not refuse to judge weights or lines; they do not refuse to copy a figure with a pencil. But tests which require an effort, for example to repeat figures, or better still, those which require an effort of invention, as finding the most words possible in three or five minutes, are repugnant to them.

But since the tests requiring the most effort and containing the most serious difficulties belong to the higher degrees of our scale of intelligence, an important consequence for the measure of intelligence results, which is that the rebellious are likely to respond only to the lower tests and are therefore judged less intelligent than they really are. The character which is rebellious, sulky, sullen, in a word who is unwilling to submit to our psychological tests, produces the effect of an apparent abasement of intellectual level and causes us to underestimate such individuals.

Let us now pass to the docile group; they are perhaps less varied than the rebellious. First notice Denise, a low grade imbecile, a short little woman of twenty-five years with small black eyes brilliant and mobile, who is extremely pleasant. The

moment she enters the office, she holds out her hand and begins to laugh, showing her beautiful white teeth. She laughs at everything and nothing; she is very docile, even affectionate. The first time that she saw us she was less exuberant, more respectful, wished to kiss the hand that we held out to her; little



FIG. 7. DENISE, IMBECILE OF LOW GRADE, AGE TWENTY-SIX YEARS. SHE UNDERSTANDS LANGUAGE BUT DOES NOT SPEAK MORE THAN THREE OR FOUR WORDS. INTELLECTUAL LEVEL OF TWO AND ONE-HALF YEARS.

by little she began to feel at home, got up and sat down as it pleased her, laughed continually with an air of mockery, and on one occasion became so familiar as to attempt to tickle us under the chin. But if strange visitors enter the room where we are, she immediately collects herself, remains in her chair without saying anything, watches them seriously, even with some dis-

trust, and does not abandon herself to her habitual foolish laughter before them even when encouraged to do so.

Victor, a middle grade imbecile of fifty, has more gravity, especially in the beginning, but is equally docile. Little by little he grew familiar with us, to the point of losing his sense of propriety; at the end of the second interview, seeing that one of us asked him difficult questions, he addressed his questioner



FIG. 8. DENISE MIMICKING SHE IMITATES, WHILE LAUGHING, ALL THE GESTURES THAT ONE MAKES IN FRONT OF HER.

in these terms, "*toi ficelle*" and seeing that we laughed he acquired the habit of this familiarity. Another time we asked him to notice and afterwards to recount all that we had done before him. This game amused him; on seeing us take from the table an object which we ostentatiously put in our pocket, he sprang forward seizing our arm and crying, "*T'ai vu, ficelle,* *Toute au clou,*" and similar expressions. In spite of these transient familiarities he remains always respectful and perfectly willing to try our experiments.

The deference of Albert is still more marked, and he is one of our most brilliant imbeciles. We have never found a more docile school boy, nor one more submissive. Never a movement of impatience, an expression of weariness nor fatigue. Albert would be a model laboratory subject, such as foreign psychological laboratories made a specialty of some time ago.

Finally a moron, Griffon, carries his willingness to the point of servility.



FIG. 9. VICTOR, IMBECILE OF FIFTY-THREE YEARS, WHO HAS THE INTELLECTUAL LEVEL OF A CHILD OF FIVE YEARS.

It must not be thought that deference is necessarily a sign of good will or of altruism. We are informed that Griffon, so docile with us, is a frank egotist in his family. When one of his relatives comes to see him at the institution, he immediately holds out his hand to the new arrival to take what has been brought for him.

Docility and rebelliousness take on an abnormal character only when they are in excess. Docility and rebelliousness are pri-

marily social qualities, because they manifest themselves when an individual enters into relation with his kind, and they have someone outside themselves for their principal object. The equivalents of these qualities are found among the majority of people; they are qualities which should be considered normal. Among ordinary individuals they may often be the result of calculation or after-thought, or they may manifest themselves chiefly in response to certain persons or certain events. Our observation of defectives shows us that, although these qualities may vary somewhat according to the individuals and the occasions which are the exciting causes, they correspond to the general disposition, giving the tone to all the reactions of the individual; they have therefore a deep source and a fundamental character. In a word, it is not toward a certain person that the idiot M—— is snappish and ugly, she is that toward all and in a perfectly constant way. Albert ——, on the contrary, is charming toward everybody although he may have a particular fondness for certain persons.

We notice that these social feelings are distinctive among defectives only on account of their strength; and it is this which marks them subnormal. There are docile and restive persons among those with whom we rub elbows every day of our lives, but they hold their feelings in better control than do the imbeciles. We cited a short time ago the young idiot who did not even look at us but broke everything that came in her way. This degree of turbulency has in itself something abnormal. A school child who acted thus with his master, who neither obeyed nor listened, who laughed at authority, who was ugly with his comrades, would be looked upon as an abnormal, incorrigible child. At this moment the public schools are trying to rid themselves of such children by sending them to special classes. In the same way the extreme docility of certain subjects is characteristic of the typical defectives. One must be an imbecile to carry amiability beyond certain limits, but since excess in this line does not annoy others, it is not so often noticed; thus in the school no one ever complains that a child is too docile; and probably this excess of docility is often taken for application to work, and is favorably judged as a sign of attention. Here again the study of the defective brings each thing to a focus, and permits us to see in the excess of the quality a sign of abnormality.

As a conclusion to all these observations, we must admit that there is no relation between these different types of character and any certain mental level. We find rebellious and also docile beings at every degree of defectiveness.

This proposition is contrary to an idea which is actually very widespread. A contemporary has defined "idiot" as an *extra-social* being and "imbecile" as an *anti-social* being. These are curious and suggestive definitions which have been so successful that they have passed from the medical domain to the domain of philosophy. One finds them today reproduced in some classic manuals of philosophy, which gives them indeed supreme sanctity. In our opinion the truth is less simple than this.

An extra-social being is one who lives on the margin of society because he is incapable of adapting himself to it. It is clear that idiots are more extra-social than imbeciles, because their intellectual level is lower. But social adaptation is not in any sense a faculty; it is a result; and that result depends upon many factors besides that of intellectual level. These factors are: the surroundings, the family, the financial condition, etc. We have met a low grade imbecile who was nearly capable of adapting himself for he earned a franc a day blowing the bellows of a forge; while some imbeciles of higher grade, and consequently much more intelligent, could not gain a livelihood for themselves. In that which concerns the quality anti-social, we shall make not only some reservations, but some criticisms upon the application of this term to the imbecile alone. This is a quality which depends upon character; it consists in being rebellious and even harmful, but we believe and we have demonstrated, that among imbeciles there are quite as many docile as rebellious ones, and that these individuals do not deserve therefore to be classed as a whole and without distinction among the anti-social. The character has no relation to the intellectual level.

One day there was a discussion in regard to a piece of decoration to be placed in a public square. No agreement could be reached. An architect came upon the scene and said, "*Nothing* is sometimes a good thing in architecture." This is equally true in psychiatry. In the place of these beautiful expressions of *extra-social* and *anti-social*, we shall put nothing; there is nothing to put.

II. ATTENTION CONSIDERED FROM THE POINT OF VIEW OF ITS CONCENTRATION

Many erroneous statements have been made in regard to the attention of defectives. Some have claimed that the idiot is absolutely lacking in attention, that he is an imbecile without attention, in a word, that it is the failure of attention which produces the idiot. Other authors have objected to this. The attention of idiots they say is not reduced to zero; there exists a little, a very little to be sure, but there is more in the imbecile and still more in the moron.

We shall treat this question of attention by a very different method. We do not like these distinctions of little and much; and we cannot see what advantages would be gained by proving that the attention is better among morons than among imbeciles. This distinction is not false, but the idea is so vague that it is scarcely worthy of an attendant in a hospital. We shall endeavor to analyze the state of attention in idiots, imbeciles, and morons, and we hope to be able to show the precise characteristics by which the attention of an idiot—because he undeniably has attention—differs from that of an imbecile. The characteristic to which we shall attach the most importance is that of the concentration of the attention. We shall ask ourselves, (1) Can the attention of this subject be excited, awakened, and fixed upon a particular point? (2) Can this attention once attracted be held for a certain time? (3) If a cause of distraction occurs, and the attention is diverted, can it spontaneously return to the first object which it quitted? (4) Can it even resist the cause of distraction, and remain fixed upon the same object, in spite of all influences which would turn it aside? These are the four degrees which we shall study, and which correspond to an ever higher and higher organization of the attention.

Let us begin with idiots. We shall again mention Vouzin—, the young idiot of twenty years in whom we have especially studied the phenomena of attention during a whole sitting. We have said before that his character is docile. Except on very rare

occasions he shows no resistance to the orders given him. But what can he do in the way of attention?

Let us consider him as he is seated by our side. He is not at all attentive, he does not look at us. His glance wanders from one object to another without fixing itself upon any. Vouzin resembles a person who is waiting for his turn in the reception room of a doctor or dentist, and remains in almost absolute idleness, the attention relaxed, the look wandering. From time to time, there is produced in him a brief act of attention without our intervention. For example: we turn before him the handle of a music box, which produces a strong grinding sound. Greatly perplexed by the sound, Vouzin seizes the music box and turns the handle as he has seen us do in order to produce the same sound, but very soon abandons this. When we wish to again attract his attention, we have considerable trouble. He does not look at us when we call. We are obliged to shout, to make violent gestures in order to attract his attention which is extremely fleeting. His look rests upon us for a moment, then we continue to call and gesticulate in vain. Vouzin looks over our shoulder into the depths of the court where absolutely nothing is going on. Another example: we give Vouzin a biscuit and let him eat a part of it, then we take it away and holding the end of the biscuit in our hand under his nose, we walk backwards. Quite naturally Vouzin looks at the biscuit and follows it, taking a few steps and making a little guttural cry, but very soon his look wanders; he fixes it elsewhere and acts as though he had forgotten the biscuit. It is not even a passing distraction; he goes elsewhere, and bothers himself no more about us, nor does he return to us. On the contrary we are obliged to go and hunt him, to put the biscuit again under his nose to make him consent to look at it. If he were normal, this falling off of attention might be explained by preoccupation or distraction or by a particular attitude. Show a biscuit to a school-boy, and then move away and it is not likely that he would follow you. Even a normal boy of the primary school would be a little ashamed to follow you, thus showing that he was obeying a gluttonous desire. But it is evident that Vouzin is not held back by any complex motive. This is the advantage of these inferior brains that all secondary and disturbing factors are suppressed in them. For this reason the psychology of the idiot would be so profitable

if one could fathom it. It is evident that Vouzin shows no sustained attention even for that which is of most interest for him, food. He acts in a more senseless manner than a dog to whom one shows a lump of sugar. The dog, if he is fond of sugar, stops and looks at it; it does not hold his attention indefinitely; now and then he turns his head, looks elsewhere as though he had a moment of distraction, or need of rest, but soon his look comes back spontaneously to the lump of sugar. With the animal there is a particular orientation of the attention which persists in spite of its temporary lapses. It is this persistence that Vouzin lacks. Strictly speaking, it is not a fault of memory, that is to say a fault of reproduction after an interval of forgetfulness; it is a more elementary process, consisting in the *persistence of a direction*. It is a question of always returning to the same state, of following the same direction, and Vouzin cannot do it.

We find in him therefore a weakness of the power of attention, which manifests itself by the following signs; it is difficult to arouse his attention, and more difficult still to hold it. We may say that he attains the first degree of concentration of the attention with very little fixation.

A means of reinforcing the attention of an idiot. Nevertheless, quite by chance we encountered a situation where Vouzin gave us quite prolonged attention instead of forgetting us. This is true when we give him orders to execute. We have said before that he executed the order to sit down when shown a chair with an imperious gesture. We complicate the orders by putting five or six chairs in a circle. Then standing like an animal tamer, we give our orders with a gesture of the hand, and Vouzin seats himself successively in all the chairs. He shows no desire to resist, and goes the round of the circle of chairs three or four times, which makes him repeat the act of sitting some fifteen times. But we are obliged to give him an order before each act; if we do not renew the gesture, he remains seated and does not get the idea of taking the next chair. We remark again how much his docility depends upon the intensity of the gesture. If we are two meters from him or if we are seated, circumstances which obviously diminish the energy of our order, Vouzin does not execute it.

In this connection we recall having proved some time back

that when a suggestion to a hysteria patient is given in a soft voice, or with only a slightly imperative word, the order is only partially executed.

It can thus be seen that the mental relation established between Vouzin and ourselves is prolonged when we cause him to execute successive acts in a series. This is a means of exerting a power over his intelligence. This resembles the pedagogical procedure of La Martinière who keeps the pupil moving in order to make him attentive.¹

It is undeniable that the imbecile and the moron are more attentive to us, to our gestures, and above all to our words than the idiot is, and this is easily explained. They understand our words, while an idiot does not. The principal indication, wholly external, of this difference in the power of attention is that the *imbecile is capable of assuming the attitude of a well-behaved pupil in school*. He listens when we speak to him, remains seated, often looks at us with deference; remains at our disposal, and does what we ask of him; with this condition, it must be understood, that in character he belongs to the docile type. This external difference between the idiot and the imbecile, does not strikingly manifest itself unless one has taken pains to isolate the subject in a room where the causes of distraction are not numerous. Let us say first of all that the attention of the imbecile is more easily aroused and sustained than that of the idiot. This is the translation into psychological language of this observation which we have just made upon the attitude of a well behaved pupil. Let us suppose now that a cause of distraction is produced. A door opens while we are talking with our imbecile and a person enters the room. Or perhaps an attendant passes in the court before us. What becomes of the attention of our imbecile? The result depends upon his intellectual level. Denise is a low grade imbecile. She understands well enough what we say although she scarcely knows how to talk. She is very at-

¹ Thus a multiplication is given to a class to do on their slates. As soon as each pupil finishes, he leaves his place, goes to the desk, shows his slate to the professor, who tells him if his result is correct or false; all those whose results are correct line up on the right, those incorrect on the left. These comings and goings, which have the sanction of the intellectual work, augment its interest and hold the mind active, on the condition of course that the change of place is not permitted to be the occasion of disorder.

tentive in general to all that we say to her, but her attention is of short duration. For instance the window offers an attraction for her. She never fails to turn her head as soon as the door of the office opens. She wishes to see who enters, and in that case, she forgets us, because after having looked at the door her attention does not return to us. This is a lack of good manners of which she is wholly unaware. It is for the same reason that she vigorously scratches her head, and puts all the fingers possible in her nose, even in our presence. Does she belong to the idiot class? No, not altogether, because even though her attention is fleeting and without spontaneous return, one can easily enough govern this attention, and make it return to its point of departure. Denise passes quite easily the first two degrees of attention.

Nothing is more variable than the adaptation which attention presupposes. But we believe in a general way that the four degrees which we have just distinguished are a measure of intellectual level. Thus we have distinctive characteristics with a definite meaning upon which it is possible to agree; while such expressions as "little attention," "much attention" which we wish to abolish, have so to speak no precise sense at all.

Finally; the species of attention which we have just studied, might be called social attention. It is this which we try to arouse and which has for its object ourselves, our personality. We have not spoken of attention to food, nor of a host of other species of attention, because we have made our observation and experiment only in our office, and because to have studied other species of attention would require a larger field of observation. It will suffice here to note the difference between the two questions. We have established a hierarchy in the concentration of attention; we can establish similarly a hierarchy among the objects which provoke and retain the attention, according as the acts which result are more or less useful to the individual or to the species. It is from this last point of view that in general one must judge if a person has or has not attention. When the object of his attention is frivolous, one says that he is not attentive. A school boy who passes his time catching flies is very justly called inattentive; he is attentive to the flies, but not attentive to the lesson which would be infinitely more profitable to him if he listened to it. One judges also of the attention of a person according to the difficulty of the acts of attention of which

he is capable. Attention to ideas, or more properly speaking reflection, is more difficult than attention to external objects and consequently the mathematician, attentive to his problem of calculation, appears to us to exercise greater attention than the booby who with open mouth looks at what is going on in the street. We have made a special point of recalling these distinctions and phenomena, to show that the appreciation of the degrees of attention, and a hierarchy of these degrees is not a simple thing, and that in this work on defectives we have only had in view a single one of the numerous distinctions which might be made. This one which we have proposed on the different degrees of concentration of attention, seems to us one of the most convenient to follow in a rapid study made upon the intelligence of defectives.

III. VOLUNTARY EFFORT

The thing which dominates the whole question is that defectives are incapable of voluntary effort in every domain; imbeciles can remain attentive, but it is an attention which is not acute nor very active. When it requires more than an attitude of attention, one sees that they cannot succeed. Their faces, moreover, never express effort, and their brows have no vertical wrinkles. Among the tests which put in clear light this incapacity for strong attention, we shall study:

1. The time of reaction, where the voluntary effort consists in replying as quickly as possible to a signal. This is a voluntary psycho-motor effort.

2. The tests of quickness of movements, with the voluntary effort of moving as quickly as possible.

3. Tests consisting in calling up the greatest possible number of words, tests where the voluntary effort bears upon the power of calling up ideas.

4. The immediate repetition of figures, where one makes a voluntary effort to retain in the memory elements which are fleeting.

One could devise many other tests where the effort of attention would be shown; for example, the operation with money, calculation, or the simple act of counting backwards; but we have eliminated these tests, because they presuppose a certain degree of instruction, and one could not make them with all defectives. Those which we have chosen have the advantage of being suitable for the most ignorant of ignoramuses.

Every voluntary effort sets two factors at work; for the pressure of the dynamometer, there is the force of contraction of the muscles, and there is the effort of will; in the same way, for the calling up of words, the number of words found depends at the same time upon the extent of the vocabulary, and the effort put forth. One could say the same of the repetition of figures; the memory of figures works with the effort of attention. It results from this that the total result does not depend solely upon the

factor of voluntary effort. If for example a person has a good memory for figures he could repeat a great number without being obliged to make an effort. Thus an isolated experiment of a single kind would be difficult to interpret and one would be in doubt as to what part each of the two factors played. To guide this interpretation it is necessary to explore the voluntary effort in several different fields, muscles, speech, memory. It is thus that one arrives at the realization that a defective is incapable of an intense and continued voluntary effort.

Posing for a Photograph. Let us begin by citing a very simple observation. We wished to photograph most of our subjects in order to have more examples and we attempted to pose them. A person that can be posed for a photograph must be capable of some slight effort, since it is necessary to keep the body motionless during several seconds. Not all of our imbeciles are capable of remaining motionless and we were obliged to make snap shots for the lowest grade cases. As for the idiots, it was of no avail to tell them to keep quiet, not to stir—they did not obey the command. Middle grade imbeciles like Victor and Cretin, and the high grade imbecile, Albert, could keep a remarkable immobility of body; they showed only a slight tendency to move the eyes; their glance wandered from right to left, as though that was the part of the body most difficult to render immovable.

This little observation of a photographer only shows the difficulty which our defectives have in making an effort. Now we give more demonstrative and particularly more analytical examples.

The quickness of movement. Quickness is a motor quality, in which the effect of attention is best seen. It is for this reason that we have chosen it as a means of measuring the attention. The instrument which we use is simply a music box which one plays by turning a handle. Fifty turns are necessary to produce the complete melody. One listens, watch in hand, and the time divided by 50 gives the necessary time for one revolution; it is very convenient and quite inexpensive. Slight preliminary exercises proved to us that one can with a little effort turn the 50 revolutions of the handle in 10 seconds, which makes the time for one revolution two-tenths of a second.

With our defectives we are obliged to encourage them con-

tinually. We repeat a great number of times, "faster, faster." The duration is constantly longer than among normals, being from 15 to 30 seconds. They have never reached the record of 10 seconds. Besides if the handle is turned so that the same air is repeated several times they do not gain in speed. Thus Cabussel gives the following succession of periods; 17", 20", 23", 20". Even if we admit that the duration of 23" was produced accidentally by an awkward movement, it is none the less true that he loses in speed instead of gaining. The same observation holds good for Duneize 14" 14", 18", and it is, moreover, easy to explain. It is not likely that the cause is fatigue so much as it is lack of emulation. It does not interest them to turn the handle; they do not put into it any "amour-propre" as a normal would willingly do. Never have we heard an imbecile make a joyous exclamation, nor utter a word which indicated in him the desire to succeed. In this indifferent attitude one sees in strong relief their inability to give themselves wholly to any experiment. Imbeciles are not sports.

Time of reaction. When one wishes to make rapid reactions in from ten to twelve hundredths of a second, it does not suffice to remain sitting passively awaiting a signal; one must picture to one's self the signal before it is given; one must also prepare one's muscle, and put it in a state of tension. All this preparation, at once the ideational and motor—thanks to which one is like a charged cannon on the point of exploding—demands a great effort, and this effort is painful. One cannot maintain it long; there are successive oscillations in the attention thus over-stimulated; now it is fixed, now it relaxes. Let us see how our defectives behave. Albert has great difficulty in understanding that he must close his eyes, wait for the signal and make his movement in response to the signal as quickly as possible. It was necessary to repeat to him each time "raise your hand," (so that he would be ready to respond) "close your eyes," "pay attention." He held the lever waiting for the response with the greatest awkwardness, and many reactions had to be discarded because he did not succeed in shutting off the current. The most striking feature in this series of reactions is that they are extremely long. They attain an average of 50 hundredths of a second, while the reaction of a normal adult requires only from 15 to 20 hundredths. We did our best to excite Albert,

solding him and ordering him to go faster. All our attempts were useless, and failed to obtain any appreciable increase of speed. His attention has therefore much less strength than one would have believed. He has the physical attitude of voluntary attention, and in external appearance he resembles an attentive pupil. But a school child has a more rapid reaction time. So what characterizes the attention of an imbecile is that it has the outward semblance, and a certain duration, since it may continue during several hours. What is lacking is depth.

With the moron Griffon we encountered in the beginning the same difficulties of explanation. In the first experiments sometimes he would react before the signal; again, when it was given he would not attempt to react until a considerable time had elapsed. And every time the same orders had to be given, "raise the hand," "close the eyes," "attention," but after a time he adapted himself and made more rapid reactions than Albert. Here is the series:

105	30	20
anticipated	28	46 (Faster!)
160	40	18
anticipated	40	22
72	45	17
anticipated	50 (Faster!)	26
anticipated	24	32
forgotten	43 (Faster!)	33
120	19	43
29	20	

These last figures tend to approach those of normal subjects. We remark in passing that Griffon is able when required, to make an effort of acceleration. If one says "Faster!", the following reaction is always shorter. Albert does not succeed in this.

Supplementary to the experiments made with Albert and Griffon, let us give that which we made with the young Beauvisage. She had in her hands the same apparatus; the same means were taken to prepare her, we gave her the same explanations repeating them a great number of times.

Here is the series of reactions that were obtained:

75''	neglect	anticipated
1'45''	1'15''	2'
65''	anticipated	4'
52''	1'	4'
anticipated	4'	4'50''
neglect	neglect	3'

These singular results have but one point of interest which is to show how the rebellious type of imbecile behaves. One would commit a singular error in supposing that Beauvisage gives here all the attention of which she is capable, and in accounting for her slow reaction by her intellectual level. The comparison with Albert prevents this error. These are the reactions of a sullen girl and not of an imbecile mentality. Furthermore we have been able to assure ourselves of this by the following means. The experimenter who had taken the series of reactions cited above was replaced by another whose age and familiarity with the technique gave him greater advantage. The times of reaction obtained by him were better, and this proves, let it be said in passing, that in certain cases *the personality of the experimenter influences the rapidity of the reaction of a subject*. Here are some of these new reactions; they are about a half minute while the preceding ones generally exceed two minutes.

46''	anticipated	anticipated
65''	43''	45''

There are no more cases of neglect and the time is very much reduced. We cite these facts first because they show curiously the influence of an attitude, and more than this they prove that in spite of the precision of figures, the times of reaction, like all other psychological measurements, have only a relative value.

On the whole the times of simple reactions are longer with defectives than with normals, even when they thoroughly understand the experiment and know what is wanted of them. This proves that the times of reaction remain, in grave cases, a good measure of the attention.

Calling up of the maximum number of words in a given time.
 "You are going to say the greatest number of words possible; you can say any words, the first that come to your mind, words like hat, house, etc. I am going to give you the signal. 'Now.'"

After this explanation which one repeats several times in order

to impress it, the normal subject can find in 3 minutes a hundred words; the number varies as can be easily understood according to a number of conditions. The principal of these are: First, a general condition, good will, emulation, zeal, courage, etc. Second, a more special condition, the extent of the vocabulary; this we learned from extended investigation among normals. On the whole this test is as good as the dynamometer, or the chronometer. It measures the effort, but an effort bearing upon a special object, the awakening of ideas. This is a sort of dynamometer of verbal ideation.

How do our defectives behave? However lacking they may be in intelligence, they possess in their heads more than two thousand words, at least high grade imbeciles and morons do. It might therefore be expected that they would easily pass this test, which does not require great intelligence. Far from it, however. They show the greatest possible signs of distress, and thus demonstrate their inability to make the effort of ideation. The effort which they cannot make with their muscles they cannot make any better with their verbal imagination.

Note first Beauvisage, high grade imbecile, but rebellious in character, who did not like this test at all. She could not bring herself to hunt for words; she cited after us "picture" and then added "table." That was the end. She declared that she could find none. It was impossible to obtain another word even at the end of 3 minutes. It is evident that this was a case of ill-will and had nothing to do with the intellectual level. Albert, high grade imbecile who is full of good will, did all in his power to please us, but was unable to find more than 20 words in 3 minutes. He often repeated "I don't know any more," and yet this was not because he was short of words, for if we carried on the experiment for 6 minutes more he found 41. We interpret this small number of 20 words as a proof of the weakness of his voluntary power.

Duneize, middle grade imbecile, cited 18 words; she often repeated the same ones (of which we kept no count).

Galiard, low grade moron, who was also very willing, but who was intellectually apathetic, succeeded less well; in 3 minutes she gives only 17 words.

Let us cite also Griffon, another moron, whose vocabulary is well developed. We were not able to obtain from him more than 22 words.

On the whole the number of words cited by our defectives is inferior to that of normals. There are, however, exceptions. One of these is Cabussel, a high grade imbecile of some thirty years.

Cabussel is microcephalic.¹

He is like the greater number of microcephalics, interesting on account of the vivacity of his manners, and above all by his loquacity. Whatever question is put to him, he enters immediately, almost without reflection, into endless details which generally are for the purpose of boasting of his own ability.

We had supposed that in spite of this abundant verbosity, Cabussel would be incapable of calling up voluntarily a great number of words. We were mistaken. He willingly accepted our invitation, and said to us with his habitual harmless vanity, "Ah, that's what I know, words," and in fact he cited 30 in 3 minutes, which is a great number for an imbecile. We interpret this result in the following manner: this test of calling up words requires, as we have said, two factors, the extent of the vocabulary and the voluntary effort. Cabussel probably exercised no more effort than the other imbeciles but having a larger vocabulary he easily found more words. His case once interpreted comes under the general rule.

Outside the small number of words cited there are other facts which show that our defectives are incapable of an effort of ideation. For example they give only names of ordinary objects, they often repeat the same word, and again, a very characteristic circumstance, they search for their words by looking about them and often name the objects they see, which is a sign of poverty of ideation.

¹ Although it is not a question of cephalometry in this article, we think it useful to describe our method of estimating the development of the head. Instead of citing the figures of the measurements, which signify nothing, we substitute a comparison of the figures representing the normal cranial development among children. Thus Cabussel, who is 1.685 m in height, a little superior to that of the normal adult, has a normal face, and a head equal in development to that of a child of seven years. It is evident that this comparison with a child of seven is much more significant than if we simply said: Cabussel has an anterior-posterior diameter of 168 millimeters, transversal of 137 millimeters, frontal of 97 millimeters, biauricular of 122, and vertical of 126, etc. These figures mean nothing without commentary.

Memory for figures. This is the last of the tests which we use to measure the capacity for effort. It will be remembered in what this consists. A person repeats a series of figures, without intonation or rhythm at a rate of two figures a second. Immediately after having been heard they are to be repeated in the order given. One must go quickly for the memory of figures which have no meaning is very fleeting. A normal subject, according to the pains he takes, can repeat from 6 to 9 figures or even more. Probably 7 is about the average number.

To this test defectives adapt themselves easily enough. They understand that they must repeat the figures, and they do so as soon as they are pronounced. Certain ones, nevertheless, find difficulty in grasping the order. Thus Cabussel begins to repeat each figure as soon as it is pronounced. If we explain laboriously to him that that is wrong, that he must wait until we have finished giving the series, before commencing the repetition, he responds by a prolonged silence, he allows precious time to pass before beginning to repeat the figures. He often cannot reproduce a single one. But Cabussel is an exception. In general, imbeciles listen to us in silence and commence to repeat the moment that we have finished.

What is the number of figures which they are capable of repeating? Although this test seems to demand but a slight degree of intelligence, yet our defectives succeed very poorly with it. According to our notes we find the results are very far from brilliant; Denise (low grade imbecile), Victor (middle grade imbecile), Beauvisage (high grade imbecile), Cretin (middle grade imbecile), repeated in general only one figure, sometimes 2.

Albert and Lanerie (high grade imbeciles) repeat 4. Guliard, Griffon, Birn (morons) repeat 5 or 6. Therefore, all without exception are below normal. There almost seems to be a relation between the intellectual level of a subject, and the number of figures he can repeat. Victor (middle grade imbecile) repeats fewer than Albert (high grade imbecile), and he in turn fewer than Griffon who is a moron. More need not be said; all our results confirm those given above and show again the incapacity for effort which exists among defectives.

As in other cases this incapacity betrays itself not only in the weakness of the numerical results; it manifests itself by incidental phenomena. Here are some of them. First the automatism

of some repetitions. It is a common occurrence among normals that when they forget a figure they have a tendency to replace it by a figure of their invention which is the continuation of the preceding. In repeating 3, 8, 2, 7, 5, if they hesitate after 2, they have a tendency to cite a figure which will be 3, or 4 consequently one nearer than 7 and betray a tendency to evoke the figures in their natural order. Ziliez, one of our students, who was the first to remark this tendency among normals, resorted to complicated calculations and numerous documents in order to make this clear. He would not have taken so much pains with defectives, because with the latter the tendency to follow the natural order is very much more marked; or rather, without being stronger it is not corrected by the critical sense; one often meets those who, after hearing a series like, 3, 8, 2, 5, 9, 4, say to you with a naïve seriousness, 1, 2, 3, 4, 5, 6, 7, 8, 9 and they insist when questioned, that they have repeated what was just said to them. Do they believe it? Probably not, but all this must be very vague in their minds. Another kind of error, which frequently occurs among them, consists in forgetting the first figures of the series. They repeat only the last like echoes. With normal subjects the distribution of errors is slightly different. It is the middle of the series which shows the signs of weakness. The beginning and the end are better retained. It has seemed to us that this difference is significant and deserves an attempt at interpretation. Here is ours. To recall the last words of a series heard is natural for the reason that one word heard disperses those heard previously and the last word covers all the rest. In order to remember the end figures it is necessary only to remain passive. On the other hand, if one wishes to recall the first figures one must struggle against forgetfulness, and repeat the figures energetically to oneself while the experimenter is saying others. This is a very active exercise which a zealous normal subject readily performs. Thanks to these supplementary repetitions, he succeeds in reviving the memory of the first figures. As to those of the middle, he has not the time to revive them and cannot give them this secondary help. Naturally, an imbecile who has less activity and especially less ingenuity than a normal does not even dream of employing this reinforcement of his first memories, and consequently he loses them along with the middle of the series,

retaining only the last, like an echo, because he does not actively intervene to preserve them.

One may be astonished that some imbeciles, however incapable of effort one supposes them, should be reduced to repeating a single figure. Is this then a measure of their field of consciousness for verbal repetitions? We disregard Beauvisage, who is rebellious and could do better probably if she applied herself. But Victor and Duneize are docile subjects. How does it happen that when we recite three figures and they understand very well what they ought to do they recite only one, the last, like an echo? Evidently one does not need to be a psychologist to realize that this monosyllabic repetition is a very small return. It is all the more surprising because imbeciles are capable of spontaneously making sentences of many more than one syllable. Victor can make sentences of from 8 to 12 syllables; and as for Duneize, when questioned about her home, she replied thus:

Q. From what country are you?

A. From the plain of St. Denis.

Q. Where do you live now?

A. In the plain St. Denis.

Q. What street?

A. By the red ball near the wine merchant there is a great door, and then it is there.

Here is a collection of little sentences which contain at least 24 syllables, and it is difficult to understand how a subject who is capable of constructing a sentence of such length should be reduced to a monosyllabic repetition. This same Duneize who repeats only one figure, can repeat a number of syllables when they make sense. Here is a fragment of attempts made upon her, as well for the memory of figures, as for that of sentences.

Words of the experimenter	Replies of the subject
2	2
4, 7	7
4, 7	ca, 7
5, 8	8
Before? what did I say?	(Silence)
3, 9	9
Before?	(Silence)
5, 1	1
shoe	shoe

Words of the experimenter— <i>Con.</i>	Replies of the subject— <i>Con.</i>
I am cold, I am very hungry.	I am very hungry.
Ta poum	Ta pou
Racao	Racao
Pif Pouf Paf	Pouf Paf
Mac ferlan	Mac ferlan
2, 3, 9	2, 3, 9,
6, 7, 4	(Silence)
6, 2, 8	8
I have a beautiful bird	Beautiful bird
I have a green frog	Green frog
I have a red and blue Polichinelle	Red and blue Polichinelle
Do, mi, sol, do	Do, mi, sol, do
Some coffee with milk and some good chocolate	Some good chocolate then some coffee with milk.

These little attempts show us that our imbecile can repeat sentences longer than two syllables. She even repeated 7 syllables. In this case the sense of the words aided their retention. But the figures have no meaning, they do not speak to the imagination; they are absolutely forbidding. To retain them one must struggle against their uninteresting character. In a word one must make an effort, and this is always the point to which we return; the defective is incapable of effort.

Conclusion. The results which we have just cited are almost a confirmation of the experiments upon the effort of attention. The utility of all this chronometry which the psychological laboratory has so much abused, has often and with reason been contested. But nevertheless it remains well demonstrated that with pathological cases of the nature of defectives these experiments upon intensive and forced attention are of incontestable value because they show the weakness of attention in a place where it might have been least suspected. Our imbecile Albert, as we have said, is the image of a perfect pupil, who listens motionless in his seat, and might be taken as a model for restless children. At first sight he seems to be extremely attentive, but this is only in appearance and quite superficial. The test upon the time of reaction, among others, shows this clearly. The time of reaction of a good pupil is from 12 to 15 hundredths of a second, while that of our imbecile is 50 hundredths, which is an enormous difference. This is not, by the way, peculiar to Albert, whom we take as an example. Griffon, a moron, has longer times than a normal, although more rapid than Albert. This is easily

understood; his times of reaction are better because he is more intelligent. These tests also show us that there is a certain quality in the intelligence which is distinct from those which we have described above, such as excitation, fixation, resistance to distractions and spontaneous returns. These are qualities of the concentration of attention. There exists, besides, a more intimate quality, more effective, which may be called the intensity or the depth of attention. It is indeed by the depth of attention that our defectives differ the most from normals. This is the decisive point, the thing which we have simply supposed up to the present, which our tests first clearly bring to light.

What seems singular, when one thinks a little, is that all these tests of effort of attention are difficult and even painful, but they do not demand a particularly great intelligence; they are easy to understand, and in any case, if one takes a little pains, one can make them understood by imbeciles. Besides they do not demand a great expenditure of judgment nor invention; does it require these, for instance, to turn a handle? Evidently not. One might have supposed that the capacity for effort is distinct, independent of the intellectual level, and that the most stupid, the most limited being, is therefore capable of effort.

This would be an error, as we have just seen. Without attempting to explain anything, without even having the right to explain anything, since we have not made a study of the intimate nature of effort, we shall simply say that effort depends upon intellectual level, and that for this reason, it is denied to defectives.

It is probable that in other pathological states, where the subjects are recognized as incapable of effort, the genesis of the phenomena would be entirely different; a state of fatigue for instance, may render the effort impossible or ineffectual. Recent descriptions have strongly insisted upon the relation of fatigue to the absence of effort. Let us admit it. But remember that these same facts may be explained in other cases in a quite different manner, and that the impossibility of effort may be a direct consequence of the lowering of the intellectual level.

IV. MOVEMENTS—WRITING

After the psychogenesis of attention and of effort, let us attempt to enter into that of movement, or rather into one particular act, the very complicated act of writing. We may roughly conjecture that this act, in proportion as it is executed by persons more and more intelligent, will become more delicate, more precise, more conformable to the end proposed. It is curious to find, that in working with a graded series of defectives we obtain a series of hand-writings more and more complex, which very much resemble those which can be obtained from a series of normal children of different ages. This is curious, and in practice it might be convenient for a diagnosis. If one is in doubt as to the intellectual level of an imbecile, if one supposes, for instance, that he could reply to questions but that he does not reply because of a rebellious character, it would often be sufficient to slip a pencil into his hand and to let him write, in order to judge. Someone, perhaps Richelieu, said "With two lines of a man's writing one could have him hung." We willingly add, with a line of writing we can establish the intellectual level even among those who do not know how to write.

We will begin with the idiot, Vouzin, who cannot pronounce a single word. We give him a sheet of white paper and a sharpened pencil. He takes the pencil, which he holds awkwardly in his right hand, but he has no hesitation in recognizing the sharpened end of the pencil, and he uses only that end. He immediately begins to scribble. He traces on the paper with an incredible activity, great curvilinear movements, employing not only his fingers, but his hand, and even his forearm. As soon as he has finished we give him another sheet of paper; he commences his work with the same animation and seems to take the greatest pleasure in it. A specimen of his scribbling is reproduced in our figure 10 which represents about one quarter of the page scribbled over.

At first sight there appears to be no plan, no directing idea in the scribbling, and one might attribute it to a blind play of some

physical phenomenon; but by looking closely one can see a trace of adaptation. The movement in spite of its extent, remains within the border furnished by the dimensions of the paper, and though occasionally the line crossed the border, Vouzin never attempted to make lines on the table upon which the paper rested.

Passing next to low grade imbeciles, we place a pen in the hands



FIG. 10. SCRIBBLING OF THE IDIOT VOUZIN ON A LARGE SHEET OF PAPER.

of Denise, and we ask her to write upon the white paper. She traces no letter, no design, nothing but strokes all in the same direction but without order. When her ink is exhausted, which soon happens, she finds the ink well but dips her pen with so little attention that it frequently passes outside without her perceiving it. Figure 11 reproduces this elementary calligraphy.

It is not the simplest that could be imagined. We have seen the scribbling of Vouzin, which is still simpler, and besides, Vouzin probably could not have used a pen. The lines of Denise are

better organized; they more nearly resemble writing. Notice also that Denise does not cover one of her strokes by another as Vouzin does. Note in passing that Denise can copy nothing; a circle had been traced on her paper which she had been asked to imitate but spite of a long insistence nothing was obtained but little strokes, which she put like feet to the circle.

Gentil, a low grade imbecile, slightly superior to Denise in that he pronounces more words, has also very rudimentary writing. With a great deal of satisfaction, he traces zig-zag lines with a pencil, the point of which he had first put in his mouth. If a pen is given him, he makes the same design, hold-



FIG. 11. HANDWRITING OF DENISE, LOW GRADE IMBECILE.

ing the pen backwards, and pushing upon the point, without ever taking more ink when the pen becomes dry. He continues thus his zig-zag during a long time, although his pen traces no visible line. One might imagine that his zig-zags are of the same rudimentary character as the sweeping lines of Vouzin. But they differ by at least two characteristics; first they are formed of short strokes which are quite regular, and in the second place they do not cover one another. The lines are made in any direction but they do not cross each other.

With imbeciles of the middle grade we obtain scribblings which more nearly resemble writing. Victor constantly carries about

with him a soiled note book of 130 pages, which are methodically covered by horizontal lines of small zig-zags, carefully made from left to right; each page has at least some thirty of these little lines; they are in order, fairly parallel, and none overlapping. They are made with a pencil which is kept between the

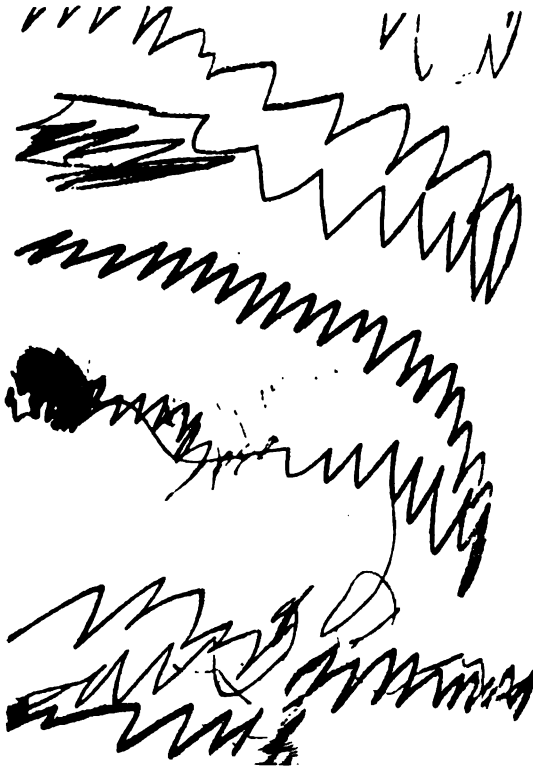


FIG. 12. HANDWRITING OF GENTIL, LOW GRADE IMBECILE. HE KEEPS WITHIN THE EDGES OF HIS PAPER.

pages of the book. Every page bears in addition a circle traced by following the outline of a sou. We have begged and implored Victor to make us a present of his note book or of at least one page. He has refused with continued persistency. All that he has consented to do, in order to be agreeable to us, has been

to make a copy of one of the pages upon a sheet of paper which we have furnished him. He traced the lines with the gravity of a Minister of State.

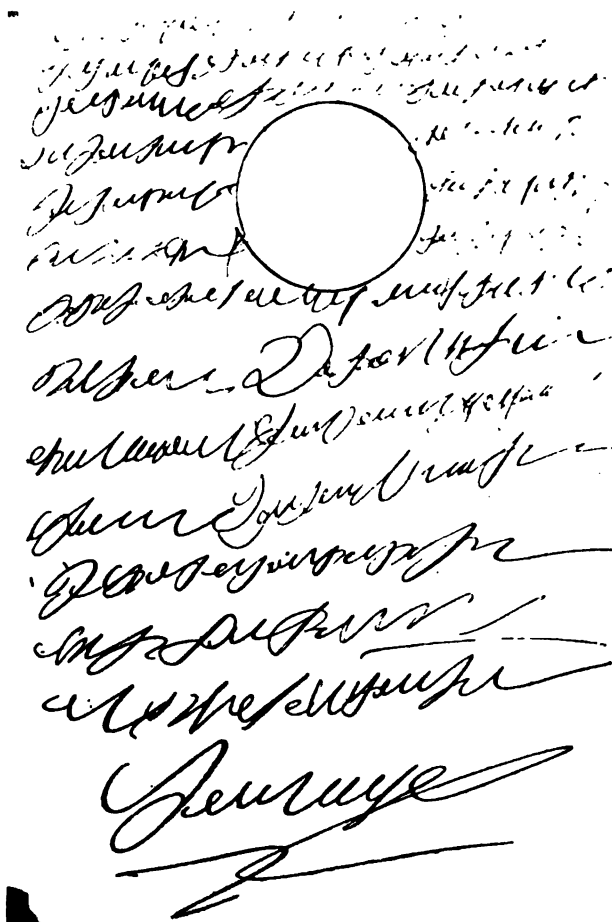


FIG. 13. A PAGE FROM THE NOTE BOOK OF VICTOR, MIDDLE GRADE IMBECILE.

His writing is much superior to that of Gentil, to which one should compare it for the two are somewhat similar. In the first place the lines traced by Victor are constantly parallel, like the lines of a manuscript, while those of Gentil are divergent and go in every direction. Besides Victor is not limited to rudimentary

zig-zags; his seem like letters more or less well traced; e, u, and p, can even be recognized.

Cretin is a young girl who belongs to the same degree of imbecility as Victor. She does not take to writing like Victor but she consented to do something for us. Her writing is not

Albert
Kouable
 094676227084846;
 3246093
 3364808264880
 3386464818641841

FIG. 14. WRITING OF ALBERT, A HIGH GRADE IMBECILE. HE WISHED TO WRITE HIS NAME AND A SERIES OF FIGURES.

unlike his, although it is more elegant and neater and is also shaded; one can almost recognize the shapes of certain letters.

As can be seen, we approach constantly nearer to writing. Duneize, high grade imbecile, when asked to write, traces one after another the letters a, u, and n, that can be easily recognized.

One would say it was a page belonging to a school child learning to write. In the same way Albert traces figures or letters. Here ends the history of illiterate writing. One degree more and we have specimens of normal writing.

We have considered it worth while to publish with brief comments these graphisms of defectives, because they clearly show the evolution of the writing movement, which as it becomes more and more organized approaches the normal movement. But what is most remarkable in this series of graphisms is that it reveals to us a law of evolution which governs not only the movements but still more the ideas. We are not yet able to fully understand that law, but we shall return to it later, and formulate it as clearly as possible, when we treat of ideation. For the moment it is sufficient to say that it constitutes a transition from the vague to the definite.

V. INTELLIGENCE AND PERCEPTION

It is worth noting that idiots, who are not helpless, and who can walk, move about without colliding with the furniture, which proves that they are capable of perceiving distances and the direction of nearby objects. The psychologist may be astonished that processes so complex, so difficult to define as those of spatial perceptions, should be capable of organization in the nervous system of an idiot. This organization presupposes associations, sensations, comparisons, fine perceptions of differences and of resemblances; think for a moment of the complicated physiology of the eye alone that is necessary to the perception of distance. There exists therefore a perceptive intelligence, which, upon analysis, is found to be very complicated, but which, nevertheless, may be developed among the lowest defectives, so low indeed that they do not understand the meaning of the simplest words.

From all this we may draw a first conclusion; since the intelligence of language is not developed in idiots but only in imbeciles, we have here the proof that the acquisition of language is something very much more difficult than the intelligence of perception. This is not surprising, however, if one recalls that even animals have extremely fine perceptions; dogs, for example, and carrier pigeons know so well the way to their home that a special sense of direction is often attributed to them.

We are going to study this intelligence of perception among imbeciles, availing ourselves of their ability to speak. We shall employ a convenient and usual method, *the investigation of the sensibility*, although we realize that, in spite of its classic character, this method has serious faults. It transposes and alters the phenomena to be studied. In reality we ask the subject to explain what he feels, and we force him to translate his state of sensibility into words. But this verbal translation cannot give us a faithful image of what that sensibility really is. In order to know what it is, one must let it live. We must, in other words, see what a subject does in the presence of a stimulus, and study

the acts of adaptation which he executes in response to this stimulus. This is quite another thing. It may happen that a person plainly perceives some very slight stimulus, and that he is incapable of explaining it or even of giving an account of it.

If the distinction which we have made seems subtle to those whose study has been limited to normal subjects, the study of the imbecile will quickly prove to them that this is a well founded distinction. In the first place some of these defectives are so low in intelligence that they understand nothing of what is asked of them. How can we explain to Denise that she must speak when we prick her, and must remain silent when we do not? She is anxious to please but will reply at random, anything to be agreeable, even though her state of sensibility may be normal, which is by no means certain. Even high grade imbeciles do not adapt themselves easily to investigations about their sensitivity.

Let us recall the case of Albert who is the gentlest, most deferential, most docile imbecile that can be imagined. We begin by asking him to close his eyes; he obeys immediately, closing them with such energy that his face is all wrinkled. We graze the back of his hand with a pen-holder and ask if he feels our touch. He replies that he feels nothing. We continue increasing the force of the contacts, and Albert still continues to affirm that he feels nothing.

Q. Do I touch you?

A. Not at all.

Q. What am I doing to you?

A. Nothing.

Is this insensibility? One might think so. It is, however, simply a misunderstanding, easy to produce with imbeciles. It is sufficient to open Albert's eyes and to let him see that we touch him to make his language change.

Q. Well now?

A. You are only using the head of a pin.

Q. Do you feel it?

A. A little.

Now, his eyes once more closed, he responds exactly as the sensation is produced; he says "You touch me," and adds, when we ask it, the localization of the contact, and it is nearly correct.

Q. But a little while ago we touched you, why did you say you felt nothing?

A. I felt nothing.

It is impossible to obtain from him any other explanation.

We do not affirm that the difficulty is insurmountable, but it exists nevertheless, and it is well to be on one's guard so that errors may be avoided.

Before every sensorial experiment one must become master of the intelligence of his subject; not only does an imbecile have trouble in understanding, but, again, being very open to suggestion, he will often reply out of desire to please. One must therefore find experiments easy to understand and free from all suggestion. If successful one perceives a very remarkable fact. This is the contrast between the weakness of the intelligence which we call verbal and social, and the delicacy of perception. Albert, who knows his letters a little, easily lends himself to an examination of vision by means of an optometrical scale. He indicates clearly at 5 meters, in the open air, 3 letters (out of 7 presented) having the height of 7 mm.

Below we give several quite characteristic cases.

Take the experiment of weights and let us see what is the slightest perceptible difference. We use boxes weighing 10 gr., 11 gr., 12 gr., 13 gr., 14 gr., 15 gr. These boxes are alike and measure 24 millimeters. They do not rattle when they are shaken. We present the boxes in the following order:

First series: 10-15, 10-14, 10-13, 10-12, 10-11.

Second series: 15-10, 15-11, 15-12, 15-13, 15-14.

The two series present increasing difficulties, the second being the more difficult, for although the absolute differences of the boxes are equal, the relative differences are smaller. Each time, the two boxes are presented in such a way that the subject does not perceive that one of them remains the same for all the presentations.

For the perception of lengths of lines there are pairs of lines placed end to end, traced in ink, that must be compared. The absolute length varies from 5 to 35 centimeters, and the difference varies from 0.5 to 0.1 cm.

What is the difficulty of appreciation which the comparison of these lines and weights supposes? We shall take as the type a normal subject of twenty-three years, a cook, whose social con-

dition is consequently analogous to that of our hospital defectives. This young girl compares all the lines without an error but finds certain pairs extremely difficult, and often repeats, "They certainly are alike, those lines." She goes over the series twice. In the test of the weights she runs over both series twice also. She commits no error but in one case she refused to pass judgment finding the difference too small to be perceived. She repeats that the test is very difficult. The difference 14-15 grams seems to be her limit, because we presented it to her five succeeding times and out of five attempts she made one error and one refusal to pass judgment. During the whole operation her attention was very good.

We can therefore conclude from this experiment, which has been confirmed by many others, that a normal subject of moderate social condition, if not hurried, can by a great effort of attention succeed in making all these comparisons correctly, but only by paying strict attention and by not going beyond a certain limit, 15 to 14 grams—which causes her doubt, suspension of judgment and even error. What do our defectives do? The manner in which they generally undertake the comparison of weights does not prepossess us in their favor. They show an awkwardness of judgment in handling and in comparing them which is very amusing. When the two boxes are handed them and they are asked which is the heavier, certain of them without weighing either put the finger upon one and say expressly, "This is the one that is heavier." Then, naturally, we explain that they must weigh the boxes before judging them. They obey; but let us examine their manner of weighing. In the first place there are those who seem to notice the weight less than the form. Duneize (middle grade imbecile) looks curiously at the boxes, turns them over and has more the appearance of measuring their size than seeing which is the heavier. Others often raise only one box and that suffices them for deciding that it is heavier than the other. Albert has a manner all his own for weighing, which is to put the boxes side by side in the same hand extended flat. It is not impossible—we have ourselves verified it—to appreciate thus a difference of weight, but this manoeuvre does not facilitate the comparison, far from it. One might therefore conclude that our defectives have a very poor perception of weight. This is an error. We shall see that nothing is so curious as the contrast between their awkwardness

in adapting themselves to a new experiment, and the cleverness that certain ones of them show for the perception of very fine differences.

Let us note the imbecile Cabussel. He has truly remarkable skill in discovering slight differences. We made him go twice over the first and second series described above. In twenty-three comparisons he made but six errors, of which three were spontaneously corrected by him and should be eliminated. There remain three errors, made on the couples 10-11, 10-14, and 10-15, two of which are among the easier series; which proves that his was an error of pure inattention, since it was not dependent upon the smallness of the difference to be perceived. This subject, by the way, is very inattentive and we should not have expected such delicacy of perception in him. This delicacy is equal to that of a normal subject. This was an unexpected, almost unbelievable fact. Is it unique? No. The same observation applies to Albert. He was not submitted to exactly the same procedure as Cabussel; we contented ourselves with making some tests with the weights 10, 11, 12, 13, 14, 15 presented in pairs so that the absolute difference was 1, 2, 3, or 4 gr. We took no account of the relative difference. Below we sum up the results given by Albert.

<i>Difference of weights</i>	<i>No. of true perceptions in 10 trials</i>
1 gr.	4
2 gr.	8
3 gr.	7
4 gr.	8

Each time Albert gave the weight putting his finger decisively and unhesitatingly on the box which seemed to him the heavier. It can be seen that he was able to perceive a difference of 2 grams when the weights varied between 10 and 15. This is a little below normal, but considering his intellectual level the result is altogether remarkable.

Let us pass to the comparison of lines—remembering that they are traced in the continuation one of the other, and that they occupy in consequence the right and the left of a white page and that all are contained in a copy book.

Albert after explanation acted as though he perceived no differences even the greatest. He was successively shown the 10

pairs; first he indicated the line on the right as the longer, then for the 9 other pairs he indicated constantly the line on the left. It is evident that his attention is not awakened and that he responds mechanically; we explain to him his error. We tell him that he must not always point to the same side that sometimes the longer line is on one side and sometimes on the other, he must look every time. After this explanation he solemnly points ten times in succession to the lines on the right. New explanations are given. We urge him sharply to compare. Again Albert shows constantly the line on the right; he is seized with automatism, nothing can be done.

We were more fortunate with Beauvisage, who is an imbecile of the same grade as Albert. Out of 21 presentations she made only three errors. This implies a truly remarkable accuracy of perception. Later when we wished to repeat the experiment, some obstacle had intervened. Was it that Beauvisage was fatigued, or indisposed or distracted by some circumstance which escaped us? We do not know; whatever the cause she was the victim of the same automatism of the right side that we had observed with Albert. During 20 presentations of pairs of lines she indicated constantly those to the right. It is curious to see such stupidity mingled with such fineness of perception. Imbecility never abdicates.

In proportion as we take subjects of higher mentality, so much nearer do we approach normality. Griffon, a moron, shows a certain delicacy in the perception of slight differences of weights. He does each of our two series twice, and fails only on the single difference 14-15, exactly like our normal subject. All this goes to show that in the experiments made upon the perceptions of defectives, in order to estimate truly, one must recognize two sorts of phenomena which manifest themselves at the same time and complicate the situation, on the one hand, the perceptions and on the other, inattention and automatism. We must make a distinction between the perception and the disturbing element, as one separates the precious almond from the bitter shell. If one succeeds in doing this, he perceives that in all grades of defectiveness the fineness of perception equals, or nearly equals, that of the normal individual.

Why is the intelligence of perception among defectives almost equal to that of normals? This is a question easily asked but not

easily answered. Darwin's theory furnishes something of a solution; the necessities of adaptation and the struggle for existence have produced this useful result; for in order to live it was necessary that every being should know the surroundings to which he tried to adapt himself; otherwise he would succumb and disappear. But this solution is a very vague explanation and certainly cannot satisfy a psychologist who is amazed at the striking contrast between the intellectual level of the defective and the acuteness of his perceptions.

We have ourselves proved, as anyone may prove for himself, how difficult it is to distinguish between 13 gr. and 15 gr. and especially 14 gr. and 15 gr. One is perplexed and lacks confidence in the accuracy of his own judgment. One cannot help asking how this imbecile, who cannot even count the number of his fingers, masters the difficult operation of comparison of weights.

We reply with this hypothesis; the perception of a difference of $\frac{1}{15}$ between two weights is a difficult operation, but it is also a simple operation. It consists properly speaking in feeling and recognizing a slight elementary sensation. There is no need of superior processes, of critical sense, or of judgment; it requires only that one be attentive for a moment, that every other idea be dropped and the attention centered on the sensation, which one seizes as it passes. The proof of this is that our normal subjects oftentimes say "I dare not keep on testing the weights or I become bewildered." In other words, intelligence is not necessary, and one who is limited to sensation and attention does better. This is why an imbecile who does not reflect nor try the weights, succeeds so well. In any case, whether our interpretation be true or false, there still remains this important fact observed years ago by us among children, that the intelligence of perception does not undergo any evolution comparable to that of the attention, of effort, or of language. It is much more precocious. One is surprised to learn that an imbecile, so inferior in swiftness of action, in repetition of figures, in holding himself motionless, in squeezing a dynamometer, in short in all experiments requiring effort, succeeds in the exact comparison of lines and weights which seems to us normals very difficult.

VI. THE SENSE OF PAIN

The study of the sensibility to pain is still more difficult than that of general or special sensibility. Pain is more closely related to the personality than all other sensibilities. The individual is not indifferent to it, as to weak sensations of sight and touch. Pain provokes more vivid feelings of apprehension, fear, anger, or even courage, or bravado through vanity; and all this contributes to form a special attitude of the subject in regard to suffering. There is therefore, a distinction to be made between pain and the personal attitude. When we study normals they reply to our questions, and can more or less give us an idea of their feelings, but this is not the case with idiots or imbeciles.

Let us first speak of what we have observed among idiots. If one suddenly pinches the skin of the arm, he quickly draws it back, often uttering a little cry, and draws back again if we attempt to repeat the experiment. This is a natural reaction like that of an animal whose tail has been stepped upon. This reaction in the idiot is not hidden by a peculiar mentality, determining him to take an attitude of bravado. In this respect the reaction is very instructive in its brevity.

Let us go farther replacing this mild excitation of pinching by an extremely painful one, that of burning. If we bring a lighted match near to the nose or the hand of most idiots what happens? Either they allow themselves to be burned without doing anything, or they scarcely react to the pain. In any case their reactions compared to those of a normal whose nose one attempts to burn, are extremely moderate. What is the cause of this difference? We see several possible causes.

1. The brain of the idiot is a diseased brain; it presents lesions in keeping with the symptoms of paralysis and contraction which one encounters in the limbs. It is possible that the idiot presents zones of analgesia and that we have stumbled unintentionally upon one of these zones; the analgesia would explain the weakness of their reactions. Evidently this is

possible, but scarcely probable, because in our multitude of experiments upon different subjects we always obtain similar results without a single exception. It is not probable that we always, by chance, encounter a zone of analgesia.

2. The idiot assumes an attitude of courage. He does not react because he controls himself. This interpretation seems to us still more improbable. An idiot is not sufficiently intelligent, we think, to assume such a complicated attitude. This is not even worthy of discussion.

3. Pain is not simply a physical sensation; it is reinforced by moral reverberation; physical pain calls up fear, disquietude, the image of great danger, and it is all this contribution of the imagination and of the feelings which gives to a painful sensation its enormous volume. Suppose, as an hypothesis, that the mental reinforcement of pain be suppressed in an individual, would not such an individual be rendered almost insensible to pain? And would this not be the case with idiots, who are intellectually inert, incapable of anxiety, or of an act of imagination which exaggerates the pain?

This last hypothesis seems to us good as far as it goes and it must have its part in the total explanation. The pain felt by an idiot must evidently be insignificant. But let us not exaggerate. There are cases where without psychic reinforcement, a pain is intolerable. Let one attempt to burn the end of his nose with a lighted match, and he will be quickly convinced. Animals react with great force to pain of this kind without needing the aid of imagination. We believe certainly that idiots are less sensitive than animals. They feel pain but the weakness of their reactions indicates slight development of the sense of pain. They show at the same time poverty of imagination and poverty of the sense of pain.

Let us pass on to imbeciles. We have tested four of these; Denise, Cretin, Albert, Griffon. If one were satisfied with the first results one would be led to conclude that the sensibility to pain in Denise and Albert is extremely weak while that of Cretin is on the contrary exaggerated. The facts, however, require a closer study, by which it will be seen that the solution is much more complex. The present study has no other purpose than to show the difficulty of investigation and to analyze certain attitudes of our subjects.

Let us take first Denise, a low grade imbecile. We turn back her sleeve to which she makes no resistance and even aids us in so doing. We then roughly pinch her skin; she cries out, evidently a cry of pain, jerks her arm away and moves away from us. Immediately we call her back. She comes running and again aids us with much interest to lift her sleeve, and allows herself to be pinched. She utters a cry of pain and moves away. Has she then forgotten the first experience, since she is so willing for the second? We begin again; she comes running to our call showing the same interest; she laughs and repeats comically with her mimicry the gesture which we had made in calling her to us; for the third time she lifts her sleeve, with the same willingness, not offering to protect herself, seeming not to suspect the least in the world that she is going to receive a painful sensation. The pinching takes place, she cries out and moves away. This is very curious, we admit, very obscure. What is it that happens in that little brain? We have made the test as many as ten times and Denise always comes back eagerly, with the same laugh, offering her arm to the slight pain of pinching. A mystic would not march more bravely to martyrdom, but here there can be no question of courage or of vanity put forth to brave suffering. Denise is too gay, too laughing when she comes running for one to suppose for an instant that she is using any voluntary effort of control. In that case she would have a different expression. Can one say she is analgesic? It is possible, at least in part, because we have plunged her hand in very hot water, and we ourselves were forced to draw it out to prevent serious burning. Moreover she has so little fear of flame that she scarcely draws back when a lighted match comes in contact with her nose; she even allows herself to be burned without a word. On the other hand, her little cry on being pinched shows that she has a certain amount of sensibility to pain. One can also suppose that her lack of apprehension comes from her inability to imagine in advance the pain of pinching which is to be inflicted upon her. She foresees the pinching but not the pain; it must be the memory of the pain that is lacking. All these explanations are possible, and we even believe that all of them contain a part of the truth. One must also take into account the childish character of Denise, she attaches importance to nothing, she allows herself to be easily distracted. Her joy-

ous nature has the same result as an attitude of bravery; it covers the perception of pain and prevents its realization.

To résumé: our conclusion is here almost the same as with the idiot. Weakness of the sense of pain, weakness of the mental reverberation; there is also a third influencing circumstance, the gay and careless character of Denise. Cretin, middle grade imbecile, behaved altogether differently. In order to learn her sensibility to pain, we raised her sleeve, slightly pinching her arm. At first she seemed amused, and smiled; indeed it was her first smile that day. Then when we attempted a second time to pinch her, she defended herself drawing back her arm vigorously. We seized her wrist without, however, causing her pain. It was nevertheless the beginning of a contest; the child began to cry loudly, and to sob, hiding her face behind her sleeve. At the end of several seconds the sobs stopped of themselves. We gave her a sou which she eagerly took and pocketed. But in spite of the gift her sullen attitude only increased, she stood up and insisted upon leaving us, repeating several times "me go."

Q. Where?

A. Eat.

Q. Eat what?

A. They are eating.

Q. You are going to eat?

A. Yes, it is time.

Q. But stay just a minute, are you afraid of us?

A. I go eat.

While giving these pretexts, she was gradually nearing the door undoubtedly desiring to open it, but not daring to put her hand on the knob. Finally we opened it ourselves and she left eagerly almost running.

The explanation must differ from that which we gave for Denise; the sensibility to pain undoubtedly exists, but there is added to it a mental reverberation that was lacking in Denise, that is fear. Cretin was really afraid of us; note also the element of aversion; not only was she afraid of us but she disliked us.

Let us conclude with Albert, the most intelligent of our imbeciles.

Raising his sleeve, without giving him any warning we pinch him sharply or prick him with a pin in a way to produce what would be a real pain to a normal person. We ask him:

Q. What was done to you?

A. You pricked me.

Q. Tell us when it pains you. (Fresh pricking—very pronounced)

A. (In a quiet voice) Ah, I feel that.

Q. But does it pain you?

A. Yes.

Albert is so little annoyed that he holds out his arm for us to continue. Other prickings which bleed do not even call out a cry. We make him plunge his index finger in water so hot as to be intolerable; he does not even wink, he holds his finger plunged a full minute in boiling water. For fear of serious results, we are obliged to intervene, drawing out his finger which is a vivid red. His countenance is unmoved—the smile is still there upon his thick lips.

Q. Is it hot?

A. I felt nothing.

Begged to try again, he does so without hesitation, plunging his finger once more into the water. Again we are obliged to draw it out. Taking our turn, we plunge our own finger before him in the boiling water, making gestures of pain to influence him. But this mimicry scarcely moves him and does not act at all as a suggestion. Invited to begin again, he shows no hesitation, leaving his finger in the water until we draw it out. If a lighted match is brought close to his nose or eyes, he draws back a little, but very slowly although he feels the pain; we could easily burn him seriously if we were not more careful than he.

How can we interpret this? It is complicated. We cannot ask for an explanation from Albert, because he would always agree with us. We suppose that he really feels the pain although doubtless not so much as a normal person. He does not, however, possess great fear, no quivering ideas of apprehension; consequently we believe he assumes an attitude of bravery, which is quite possible, since it dominates a sensibility which is not at all exaggerated. A last example; it is the moron, Griffon, upon whom we now experiment. He is seated before us, both elbows on the table, and we begin to speak of indifferent things. Without warning we reach out and pinch him severely. He utters a slight cry and tries to draw back his arm. Since he is very docile, however, and since he sees that we have a very serious attitude,

he replaces his arm, and seeing us take a pin to prick him he voluntarily submits to this attempt, enduring without winking the pain of scratching him with the pin. It is evident that with Griffon the same as Albert this is the result of an attitude of bravery, because he first gave a cry and now remains impassive.

Two conclusions result from all this. First that an attitude of fear or bravery, depending upon the character of the subject, always cooperates, more or less, with an experiment upon pain and may completely disguise the reactions to such sensibility. This is an undeniable conclusion which our imbeciles have clearly demonstrated.

As to the state of the sensibility to pain it is much more difficult to fix with precision. But we willingly admit that imbeciles have generally a certain obtuseness.

This second conclusion has been verified by many different experiments upon school children. We have proved conclusively, according to different authors, that the threshold of sensibility to pain in the most intelligent pupils is lower than in the least intelligent; in other words, to provoke in them a minimum of pain requires a slighter pressure. This finding, compared with that which we have made upon our imbeciles, clearly shows that sensibility to pain develops with the intelligence; by pain we must here understand not only a sensation localized and appreciated in its intensity, but also all the psychic reverberations of this pain, the ideas and emotions it provokes, which increase it like an avalanche. In truth the highest intelligences have more merit in being courageous than grosser natures; they are in fact braver, though not by absence of fear, not by obtuseness of the sensibilities, but by domination over a delicate sensibility, as in the case, for instance, of Turenne.

VII. THE ASSOCIATION OF IDEAS AMONG THE FEEBLE-MINDED

Our object is to discover how association of ideas among defectives is formed, and if the mechanism of the production of ideas presents in them any particular traits worthy of psychological consideration. The procedure to be followed has been described by several authors; we have made only slight changes, which, however, were quite necessary. Here is the ordinary instruction given to our subjects. "We are going to say a word, and for every word you hear you are to say one, but the word that you say must not be the same as ours." Ordinarily the directions are more precise, the word is required to be in *relation* with the word of the experimenter but we cannot make this recommendation; our imbeciles would not understand it.

The young cook of twenty-three whom we have taken as a normal subject for comparison, is very much embarrassed by the vagueness of the instructions. This young woman was constantly annoyed and dissatisfied with her replies, asking us what she ought to say, and if her words ought to relate to those given by us or not. And certainly she was quite right in asking. Her distress showed clearly the ambiguous character of the test. Of course, we did not reply to any of her questions, we made the experiment without explaining anything, and we give below the results. The times are extremely variable, between a minimum of 2 seconds and a maximum of 18. The median value, which is here much better than the average, is 5.5." The words that she gives are in the most diverse relation to the stimulus words; but all obeyed the fundamental law of completing the sense. Sometimes it might be a definition: "serpent—a creature that stings," or an effect: "shoe—for walking; water—refreshment; sun—warmth; garden—pleasure; paper—to write." Or the whole suggested by the part: "nose—face; hair—woman;" or supplementary connection "hat—coquetry;" sometimes a familiar association "knife—bread." This logical evocation, which was in no way demanded of her, however, proves

that logic is easier to follow than chance; just as a worn path is easier to follow than a direct course over the fields. We consider it worth while to give the series of replies as a standard, although necessarily it bears the stamp of individuality, and does not present so general a bearing as one could desire.

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Singer.....	14"	Actor (after a moment of embarrassment)
I run.....	18"	The beautiful path
Revolt.....	5"	War
Hat.....	4"	Coquetry
Bottle.....	7"	Liquid
Picture.....	6"	Landscape
Moustache.....	7"	Chinaman
Knife.....	6"	Bread
Paper.....	6"	Write
Hair.....	9"	Woman
Red.....	4"	Flag
Dog.....	2"	Four feet
Rain.....	8"	Bad weather
Water.....	4"	Refreshment
Garden.....	3"	Pleasure
Omelet.....	3.5"	Food
Shoe.....	4"	For walking
Syrup.....	4"	Sweetened liquids
Tobacco.....	5"	It is dried leaves
The nose.....	2.5"	Face
Sausage.....	9"	Food
The sun.....	4"	Warmth
Soldier.....	4"	Army
Newspaper.....	2"	Reading
Serpent.....	7"	A creature that stings
Misery.....	5"	The opposite of luxury
Justice.....	17"	To give what is right
Virtue.....	11"	It is a quality
Snow.....	5"	Rain
Handkerchief.....	7"	Cloth

Maximum time 18", minimum time 2". Median time 5.5".

Our defectives are distinguished from normals by many characteristics, first of all by their general attitude. We have said that our normal subject was troubled and felt quite embarrassed. This embarrassment, so characteristic of a normal person who is a novice, was not in the least shared by our imbeciles, who showed the greatest serenity and evident satisfaction in all their replies.

All began by simply repeating the stimulus word; if no observation had been made to them they would have continued the repetition, which has no interest whatever. It is curious, but it is not peculiar to defectives. We have sometimes encountered normals in previous experiments who with good faith repeated the stimulus word without adding anything and who did not perceive the absurdity of this repetition.

We intervene after a certain time and urge our defectives to use a different word from the one pronounced by us. Sometimes it is necessary to insist quite a little in order to break up this habit. Some are embarrassed. They do not know what to say. For a time they are satisfied to repeat the words which they have already used at the beginning of the experiment; but this stock is soon exhausted; they must draw new words from their imagination. The words they find vary greatly and depend upon their mental level.

Let us first mention a high grade imbecile girl, Duguet, who resorted to a singular expedient. After having passed the preliminary period of repetition, which we have just described, she cites words which have no relation with ours, and which probably she prepared beforehand. It can easily be seen because she always chooses from the same category of objects, either the names of garments or the names of objects present before her. She seems to have hesitated a little before following this direction; but it becomes evident towards the last, and the reaction times are very short, which is proof that she has prepared the word of reply.

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Singer.....	3"	Singer
I run.....	1"	I run
Revolt.....	2"	Revolt
Hat.....	8"	Hat

New explanations are given so that the subject may lose the habit of repeating.

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Bottle.....	35"	Don't know—ah—the table
Picture.....	4"	Chair
Moustache.....	4"	Bottle
Knife.....	4"	Plate
Paper.....	4"	Fork

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Hair.....	3"	Knife
Red.....	5"	Spoon
Dog.....	5"	Carafe
Rain.....	4"	Umbrella
Water.....	4"	A boat
Garden.....	5"	Dress
Omelet.....	8"	Light
Shoe.....	3"	Carpet
Syrup.....	4"	On the floor
Tobacco.....	1.5"	Hat
Sausage.....	1"	A bed
Sun.....	16"	Hat
Soldier.....	2"	Dress
Newspaper.....	2"	Apron
Serpent.....	6"	Boot maker
Misery.....	1"	Stockings
Justice.....	2"	Slipper
Virtue.....	1"	Carpet
The snow.....	2"	The door
Handkerchief.....	3"	Square
Maximum time 35", minimum time 1", Medium time 3.5".		

From time to time, e.g., "rain" and "water," a slight associative influence let itself be felt, but more often there is no connection, as is seen with such couples as misery—stockings; justice—slipper. This absence of relation is quite characteristic. A normal would never think of replying thus, for he would realize that it rendered the experiment quite useless; at least, he would not unless as a result of an attitude of mockery. In the case of Duguët, the result proves the weakness of the association of words; the word pronounced by us does not stand out because she is looking for another. The times are shorter than those of a normal but we have explained the reason.

A middle grade imbecile, Victor, shows a form of transition. He commences like Duguët, by giving words without bearing upon those pronounced; then, beginning with the word tobacco, he changes his tactics. The associative influence of the words makes itself felt.

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Singer.....	3"	Singer
I run.....	3"	I run
Revolt.....	3"	Revolt
Hat.....	0"	Hat, a cap

We urge him not to repeat the word that we have said but to find another.

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Bottle.....	7"	Belt to put around the body
Picture.....	6"	Table girdle, cravat
Moustache.....	4"	Mous- a watch
Knife.....	5"	Kni- knife put in the post
Paper.....	5"	Ah socks
Hair.....	7"	Ah cravat
Red.....	4"	Ah shirt
Dog.....	5"	Socks night shirt
Rain.....	5"	Ah night shirt
Water.....	5"	Drawers
Garden.....	4"	A spade
Omelet.....	5"	A wheelbarrow to gather dirt
Shoe.....	5"	Spade—to dig
Syrup.....	5"	Rake—to gather dirt
Tobacco.....	4"	Tobacco to smoke in a pipe
The nose.....	4"	To put tobacco in his pipe
Sausage.....	0"	Sausage to light the pipe and tinder to light the pipe
The sun.....	4"	The sun to set up there
Soldier.....	4"	I never was a soldier
Newspaper.....	4"	Newspaper. To read the news- paper in bed
Serpent.....	4"	Siphon (?)
Misery.....	2"	Misery, yes (makes sorrowful countenance)
Justice.....	4"	Just for the saving (he means for the saving bank)
Virtue.....	8"	To put on ground, to eat in sum- mer (understood lettuce, simi- lar sound in French "vertu— laitue")
Snow.....	4"	The snow to fall on the world
Handkerchief.....	4"	To blow (gesture)
Maximum time 8". Minimum time 2". Median time 4".		

Victor's times are short, shorter than those of our normal (4" instead of 5.5"). One might remark that the nature of his associations does not consist in grouping beside the spoken word a word having an entirely different sense, for instance, red-black, sun-moon, etc. Victor rather tends to develop the idea given to him, but he naturally employs very elementary processes.

With Albert, a high grade imbecile, after the preliminary period of repetition, all at once there is produced the association of ideas. There are here veritable associations, with heterogeneity of the elements. Let the reader judge.

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Singer.....		Singer
I run.....		I run
Revolt.....		Revolt
Hat.....		Hat
Bottle.....		Hat
Picture.....		Bottle
Moustache.....	12''	Cravat
Knife.....	5''	Fork
Paper.....	10''	Picture
Hair.....	9''	The head
Red.....	9''	White
Dog.....	5''	Cat
Rain.....		<i>Ression</i> (?)
Water.....	13''	The Seine
Garden.....	30''	There are flowers
Omelet.....	5''	Some eggs
Shoe.....	5''	Eggs
Syrup.....	5''	Cod liver oil
Tobacco.....	5''	Cigarette
The nose.....		Needles (probably had understood thimble (le nez....le dé)
Sausage.....	8''	Pudding
The sun.....	5''	The moon
Soldier.....	5''	Military
Newspaper.....	35''	Magazine
Serpent.....	5''	<i>serpe</i> (pruning hook)
Misery.....	50''	Anger (?)
Justice.....		The Justice
Virtue.....		Don't know what to say
The snow.....		The snow it falls, the snow
Handkerchief.....	20''	To blow one's nose

Maximum time 50''. Minimum time 5''. Median time 8''.

Albert's times are longer. The associations are of such ordinary character, or rather, so elementary, that one might have foreseen many of them. We have here results that do not seem to us clearly subnormal. An experimenter who was not forewarned might have attributed them to a normal. We will finish with the association of ideas of Griffon, a moron. These seem to us to be of an absolutely normal level, except for one or two improprieties of term or of thought.

<i>Stimulus words</i>	<i>Time</i>	<i>Reaction</i>
Singer.....	3"	Singer
I run.....	5"	To walk
Revolt.....	6"	Someone who jostles
Hat.....	7"	Hatter
Bottle.....	7"	Broken glass
Picture.....	3"	Images which represent land- scapes
Moustache.....	6"	A man who has a moustache
Knife.....	12"	Which is made with a wooden handle
Paper.....	7"	It is made with rags from the factory
Hair.....	7"	Which is on the head of a man
Red.....	13"	A cloth that is red
Dog.....	6"	An animal that is cross
Rain.....	3"	That falls on the earth
Water.....	7"	Which is found in springs
Garden.....		Which is found in the fields
Omelet.....	3"	Which is made of eggs
Shoe.....	7"	Which is made of leather
Syrup.....	5"	Which is made in factories
Tobacco.....	7"	Which is made with tobacco from the Caroline Islands
The nose.....	7"	Which is above the chin
Sausage.....	7"	Which is made with fat of pork
The sun.....	10"	Which makes the earth go
Soldier.....	10"	Represents the earth
Newspaper.....	5"	Which is made in the printing shop
Serpent.....	6"	Which is found in the fields
Misery.....	2"	A man who is unhappy
Virtue.....	8"	A man who is good
The snow.....	3"	That falls on the earth
Handkerchief.....	6"	Which is made with rags

Maximum time 13". Minimum time 2". Median time 7".

The replies of Griffon have the form of appreciations, of judgment, of definitions, much more than true associations. The times are quite long.

Let us sum up, now, what these experiments upon the association of ideas have taught us. The difference between the defective and the normal is seen constantly in the attitude taken, particularly in the beginning of the experiment. While the normal subject is embarrassed and protests that he does not know what is required of him, the imbecile and the moron, adapt them-

selves at once to the instructions of the new experiment. There is in this uneasiness at the beginning a mental state of higher order, which unfortunately cannot be written down with the replies of the subject, and which, so to speak, evaporates. It is a pity, for it forms a most characteristic difference. The length of the reaction times is also very significant. If we take the median times, we can see they are very much shorter with the defectives who are of low level, or who give reactions of an inferior quality; let us put these median times into a series; we have 3.5"-4"-8"-7". This series is too short for us to be able to interpret it safely. We venture, however, to conclude from it that the time depends upon the more or less elementary character of the reaction, and that, considered separately, the reaction time signifies nothing more than the time required to do a certain problem when we are not told in what the problem consists. Let us add that similar studies upon eight normal school children, aged from ten to twelve years, have furnished us with the following median times, which represent each about thirty association experiments: 4"-5.3"-5.7"-6.7"-7.3"-7.5"-12.1"-19" of which the median would be 7. This is a new argument to demonstrate that the association times are longer with normals than with imbeciles, without doubt because the former have more ideas to choose from. From this we can draw the following important conclusion in regard to the ideation of the imbecile.

When a normal reflects upon something, he does not content himself with evoking an image, but he has an end towards which he tends, and he tries to adjust his images to this end, and for this adjustment he chooses among his images, he seeks for, he rejects, and he retains. This work of selection is one in which the intelligence of the agent manifests itself. When asked to say a word after the word pronounced, he seeks more or less to find a suitable word; this causes frequent embarrassment and often rather long times before replying. With imbeciles, the work of ideation seems to be much more simple. The imbecile probably says the first word that comes to his mind; at all events if he rejects certain words as inappropriate, this work of selection is very short, very restricted; he does not possess much choice of words, he is not embarrassed, and consequently the work is more elementary, more rapid. If one gave a prize for rapidity it is the imbeciles who would win. As to the nature of the

associations, it is evident that it can serve to distinguish only extremely low defectives like Victor and Duguet. We have seen that with them that which we have called "the associative action of words" does not take place for some time; but with Albert and with Griffon, the associations formed present nothing peculiar, that is have no fixed relation to deficiency. One can conclude from this that it is not by the word of the inner language that the defective is differentiated from the normal; it is by the sentence rather than by the word; by the thought rather than by the image; by the organization rather than by the nature of the elements which are to be organized.

VIII. THE ACTIVITY OF THE INTELLIGENCE DISTINGUISHED FROM THE LEVEL OF THE INTELLIGENCE

The purpose of this short chapter is to point out an error or rather to note a necessary distinction which is often unrecognized, the distinction between the intellectual activity and the intellectual level. Ordinarily the two are confounded; one imagines that the activity and the level are on a par and that a being who has an active intelligence, one who talks much and who has many ideas, is an intelligent being. Observations made upon defectives will throw light upon this point.

In general imbeciles have a sluggish intelligence, and the conversation which one can hold with them is extremely flat. They have nothing to say, nothing to relate; they can imagine nothing, and hence are very brief; for instance there is Albert, a high grade imbecile, of whom we have already spoken. Let us converse with him and examine his remarks which show an extreme poverty of ideas. The first time we saw him the following dialogue took place between us:

Q. What is your name?

A. Albert Ernest.

Q. How old are you?

A. Twenty-six years old.

Q. Why were you sent to this institution?

A. You see, my sister had a dispute with my brother-in-law, she preferred to put me away.

Q. Why did your sister dispute thus with your brother-in-law?

A. Because he is a man who drinks.

Q. Ah! and then?

A. He did not want me with him.

Q. Truly?

A. And yet I did all the work.

Q. What did he say to make you leave?

A. Dreadful words. He even went and said at the "*fréfecture*" I was full of lice.

Information obtained showed us that the brother-in-law drank, and had several times been locked up as an alcoholic. Albert's

sister is now getting a divorce from her husband. It is easy to understand how it happened. Albert up to that time had been kept by his family. Dissension had arisen, pecuniary difficulties followed, and the imbecile could no longer remain in their charge.



FIG. 15. ALBERT, HIGH GRADE IMBECILE, TWENTY-SIX YEARS OLD.
MENTAL LEVEL OF CHILD OF SEVEN.

Q. What was your trade?

A. My trade was to work in the market in the morning. I loaded the wagons.

Q. Were you strong?

A. Very strong.

Q. How much did you make at the market?

A. Twenty sous a day and the customers gave me tips.

Q. How much money did you get for tips?

A. Fourteen sous.

Q. Altogether, how much did you make?

A. In all 29 sous.

Q. What did you do with that money?

A. I gave it to my sister.

Q. Why did you give it to her?

A. (With some emphasis). Because it was my duty.

Q. But everyone does not give his money to his sister.

A. Not everybody.

Q. What persons do it?

A. It's those who get married, those who drink too much, who spend their money.

Q. You were getting married?

A. Ah, no.

We learned that Albert willingly got up early in the morning to go to the market. He was very fond of his work. He quarreled with no one unless it was with his brother-in-law, whom he could not endure. He took long trips through the streets and found his way easily enough. He could go out alone without causing any trouble, because he did not take up with people whom he did not know; in a word, a very good subject, very affectionate, very gentle. He wept at the death of his mother, which had recently occurred, but his sorrow did not last long. He was careful of his person, even foppish for he liked to be well dressed. He often carried flowers to the women living in the same house as himself. We said to him jokingly that he ought to marry; the idea pleased him, he had chosen many women to whom he made love platonically, with flowers and bouquets.

Q. From what country are you?

A. From the Batignolles. (A quarter of Paris).

Q. Is that in a city, Batignolles?

A. Yes.

Q. In which city?

A. It is a city of Marseilles.

Q. Yes, but when one is in Batignolles, can one say "I am English?"

A. I am Parisian, I am not English.

Q. What is the date of your birth?

A. Ah! I do not know.

Q. When did you come here?

A. Yesterday. (correct)

Q. What day is today?

A. Wednesday. (correct)

Q. And what was yesterday?

A. Tuesday.

- Q. And tomorrow?
 A. Thursday.
 Q. How many days in the week?
 A. Five days.
 Q. Is it morning or afternoon?
 A. Afternoon. (correct)
 Q. Why?
 A. Because it is afternoon.
 Q. What year is it?
 A. The month of April.
 Q. But the year?
 A. I do not know.
 Q. What is the name of the President of the Republic?
 A. Ah! I do not know.
 Q. You have been to school?
 A. Yes, in the street l'Arbre-Sec.
 Q. What does your father do?
 A. My father had a butcher shop in Paris, rue du Jour.
 Q. Who has his shop now?
 A. A man who used to work in the shop.
 Q. And your mother?
 A. She was a trades woman. It is my sister—who has had the medal.
 Q. You have brothers?
 A. Ah! my brothers are dead.
 Q. But you, you are not dead, even if you have come into the world?
 A. Ah! no "msieu."
 Q. Does everyone die?
 A. Yes.
 Q. How is one when he is dead?
 A. One never comes back.
 Q. And God, where is He?
 A. He is in heaven.
 Q. Does He concern Himself about us?
 A. It is on Him that we call.
 Q. How is that?
 A. It is our soul that calls us.
 Q. Ah! Where is our soul.
 A. Our souls, that is where our heart is It is our soul that speaks.

He replies neither rapidly nor slowly; and we would not have noted the quickness of his responses if we had not needed to take it as a basis for comparison with other subjects.

Let us examine his verbal spontaneity. It is weak. He can only find a few words by himself. After a long absence on our part, we saw him again.

Q. What have you done my friend, in this long time since I have had the pleasure of seeing you?

A. I have swept.

Q. And then?

A. And then I cleaned the tiles—the tiles in the hall.

Q. And then?

A. And then I began again—after breakfast.

Q. And then?

A. I don't know.

Q. And yesterday? What did you do yesterday? Tell me about it, give me the details.

A. Yesterday I swept too.

Q. And then?

A. And then when I had finished sweeping they sent me to the garden. ("jardin"). (He meant the attendant "gardien").

Q. And then?

A. Ah! I don't know.

It is impossible to obtain any other explanation. If this imbecile had been the only witness of a complicated scene, and one wished to know what had happened, it would have been terribly difficult to find out.

One day Albert came to us with a blue kitchen apron knotted around his waist. We feigned amazement.

Q. Why have you that apron around your waist?

A. (With a stupid smile) I'm a plunger.

Q. You bathe, do you? Is there a basin of water that you plunge into?

A. No, I wash the dishes.

He is very proud of this new duty, and we are assured that since he has filled it he carries his head differently. But it is impossible to make him express this feeling or anything analogous to it.

Q. You like to wash the dishes?

A. Yes.

Q. Well, tell us about it—say something.

A. I don't know what to say.

Another time we succeeded in making him tell a story of his own invention. It was the first time that he had ever done it and we suppose that we owe the story to his extreme docility. Here it is, literally reproduced. "A dog—a white dog—that I took to walk in the woods—that ran after the rabbits. The dog got away from my hands and I lost him in the woods. The

rabbit came and found me, and asked me how it happened that I had that rabbit. It was my dog that caught it. I go home with the rabbit. My relatives ask me how I came by it. I tell them that my dog caught it and I was almost arrested by a policeman. My relatives told me that I ought not to have done it."

Q. Is that a made-up story?

A. Yes.

Q. Some one told it to you, or have you told it before?

A. No, nobody, because I saw it in a picture.

It is evident from the turn of the sentences, the foundation of the story, and the final conclusion, that this is the story of a child.

Contrast this with a loquacious imbecile, Cabussel, a big jovial fellow, 1.685 meters (67.4 in.) in height, with the little head of a child of seven years. He has very brilliant, black eyes, and a great black moustache, which he smooths and combs from time to time with the greatest care. The moment he is spoken to, one is struck with his loquacity. He talks so rapidly that we, who wished to record verbatim the replies of our imbeciles, were unable to follow him and for the first time were obliged to employ a stenographer.

Let us give a sample of his abundant conversation.

Q. What is your age?

A. Me, monsieur? Twenty-eight the month of April. I belong to 79.

Q. You know how to read?

A. Yes, monsieur, I can read and count money and everything. And I can do errands and everything.

Q. What is your business?

A. Me, tailor. I work with my father. I know how to make overcoats, dress coats, jackets. I also carry the coal. I know politics, too. When I go to get the paper, I see what is going on.

He praises himself. He is a great braggart.

Q. Where were you at school?

A. Rue Domet.

Q. Have you a certificate?

A. Yes, monsieur. (Absolutely false)

Q. Can you count?

A. Yes, monsieur. I can do problems, subtractions, divisions.

Q. Write: (one of us dictates) The pretty little girls have studied the flowers. (He takes the pen but does not write).

A. Ah! I have fifty of them, me

Q. Fifty what?

A. Fifty women. I had one twenty years old. (Several rather loose remarks follow).



FIG. 18. CABUSSEL, HIGH GRADE IMBECILE, OF TWENTY-EIGHT YEARS. VERY LOQUACIOUS; LEVEL MENTAL OF A CHILD OF SEVEN.

Q. Very well but write what I dictate. The pretty little

A. (With a smile). Ah! I don't know very well how to write I haven't been in school much.

Q. You can at least write your name.

A. I know how to write, me (He commenced to print some letters.) I begin with a C (He writes his name).

Q. Write Papa.

A. (With a roguish air). That begins with a P. (He tries but cannot write Papa). Paris, I can write that very well. (He prints the word Paris.) Ah! I know how to count. If you wish I can count up to 100.

Q. Well, go ahead.

A. (Making a show) I begin with 1. (He counts correctly up to 65, then he says 65, 67, 68, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 100. He is well satisfied).

Q. And read? Can you read?

A. (He takes the newspaper that we hand him and follows the lines with his finger without saying anything).

Q. No, read out loud. How do you expect me to hear?

A. Ah! (with a coaxing smile) that is a little difficult.

Q. Spell out the letters.

A. I learned the a, b, c's.

Q. Very well, spell.

A. (He spells and commits numerous errors; besides he skips the letters he does not know).

Q. Who is President of the Republic?

A. Fallières, and before him it was Loubet. And they say that the one who is deputy at Javel is worth nothing at all. He had more than 1000 firemen killed. He is an assassin, that man. It was like Casimir-Perier . . . he did not stay long. He gave in his *dmission*. Philosphore (Félix Faure) was poisoned, he was. He poisoned like that his friends . . . He made a good dinner with poison in it.

Q. How do you know that?

A. It was in the Petit Journal. (Note that he cannot read.)

Q. You read it?

A. Yes, yes.

Q. Who was Gambetta?

A. He was a great man. Went in a balloon . . . Field of battle . . . And then. Savaro died with his mechanician . . . he fell upon a place, from 25 meters high. And then Santo Dumont took a bath in the sea. He was saved, he was. He is a good fellow. When he goes out he gives pieces of a hundred sous, to get the clothes that are at the Mont de Piété, sheets, handkerchiefs, housekeeping things. It is he who does that.

Q. How did you know that?

A. It is in the paper. That is well known.

Q. And Monsieur Thiers?

A. Thiers? He was good for nothing, he was. He had everybody killed with paving stones, in his carriage. He put them to the edge of the sword.

Q. How do you know that?

A. I heard them talk at home. And Napoleon the 1st. He was a good fellow, he was. He died at St. Helena in 1840, the defeat of Waterloo. I knew him, I did. I was at the Invalides as guard.

Q. As guard at the Invalides? What did you do there?

A. I answered everybody's questions.

Q. What else?

A. I said, "Don't touch. I'll hit you in the face." (It is highly improbable that he was ever a guard at the Invalides).

Q. And Louis XIV?

A. Ah! Louis XIV he reigned a lot, he did. And Louis XV too. Louis XIV a bad type, he was. He passed to the guillotine, by Deibler, rue de la Roquette. The guillotine it was Dr. Guillotin who invented that to cut the neck.



FIG. 17. CABUSSEL TRYING TO WRITE FROM DICTATION.

Q. And before, what did they do?

A. It was like it was in America. They hung them with a big rope, and then they flung them into a hole. It was like Rochefort. They sent him away, and he was for politics. They wouldn't let him talk, and they shut him up here where I am. And then from here they exiled him to Numea.

Q. And Charlemagne, do you know him?

A. No. It was Louis XIV, Charlemagne and Charles the Bold and Louis XVII and Alphonse XIII, they are the new kings.

This dialogue shows the loquacity of Cabussel. Once started, he scarcely stops. With him there is no need of constant urging as there is with the other imbeciles who speak only when one keeps saying "And then?" His loquacity is not, however verbal excitation, analogous to that of maniacs. Cabussel does not speak unless he knows or thinks he knows. His naïve vanity and boastfulness are quite apparent but too unconscious to be harshly criticised. He knows many things, but he knows them badly and he distorts them in the reproduction. One wonders how he could learn all that; we should not have supposed that he knew the names of Thiers, Rochefort, and still less who were Louis XIV and Dr. Guillotin.

"At home," he said one day, "they call me orator. And then every Sunday I go to the Deputy Chamber; the Minister receives me." Taking advantage of the occasion, we ask him to deliver a discourse; he willingly consents.

A. I will talk to you about war.

(He rises, adjusts his coat, twists his moustache, crosses his arms. Then he delivers the discourse which we give below. He speaks slowly and pauses constantly to find words and ideas. One should read this discourse carefully. It is a choice expression of vanity in an imbecile).

"Once upon a time the war to die on the field of battle it's my idea hem much squabbling in case of war much squabbling Ah! the one who will be with me him, like a good boy: I'll know how to defend him plead his cause for him I will plead to his God for myself Perhaps in two weeks I will be no more in Paris. I will be perhaps an exile in prison I shall not be able to get away from it I shall be able to get away in chains I shall not be able to get out of them in prison they will give me black bread and water on a board If I go out again I shall be very miserable And then, when I am among the chiefs I shall be decorated I shall pass as minister of war I shall pass as minister of the Interior, of Finance. And when there is money, it is I who shall dabble in it. I shall gain money. I shall be admiral After that I can marry a pretty, beautiful woman! I shall have children I shall rest in a beautiful castle coast of France and it will be a beautiful castle there will be kings and lords and then soldiers about me to regard me and then I shall have servants, and carriages and horses.

And then one could go to the country to the watering place. Ah! especially it's cake that I want; at least fifteen thousand francs After that I shall be happy I shall live to be eighty years old even a hundred and two years old fifty five years, fifty six years, fifty eight, fifty nine, fifty seven, fifty eight, fifty nine, sixty, one hundred up to a thousand years I shall live. I shall do like Jesus Christ.

Q. And then?

A. He was baptized, thirty five years Jesus Christ; it was in a Protestant temple he wasn't French, they made him Catholic, and Roman. The priest he said, Eat my flesh and drink my blood. Do this in memory of Jesus Christ. Amen."

This discourse is a precious morsel of eloquence which cannot easily be obtained from an imbecile. It is precious because it reveals to us, better than any test of association of ideas, how the ideation of Cabussel develops. This ideation, on the whole very poor, is dominated by a single thought which makes unity of the fragment, that is the glorification of his own personality. Cabussel truly speaks only of himself, thinks only of himself. It is a vanity at once naïve and enormous; notice carefully in passing that this vanity is neither pride nor self respect, it produces no emulation, no generous effort. The vanity of Cabussel gives him at times a sentiment of pity for himself, as when he sees himself in prison; mostly, however, another sentiment dominates, that of expansion, grandeur. There is no delirium, for Cabussel affirms nothing, he only wishes, imagines, dreams, but he lives in his dreams. The sentences which he employs have often a precise and clear significance; sometimes he alters them and involuntarily gives them a comic sense, as when he says the soldiers would *regard* him. Doubtless he intended to say "guard" him. He does not hesitate to use set formulas as "plead his cause for him," "plead to his God for me," and he is so completely controlled by automatic associations, that having commenced by speaking of war, he ends by entertaining us about Jesus Christ. In spite of his desire to be grandiloquent, he is obliged to make so many pauses, waiting for ideas which do not come, that the effect of his discourse is spoiled. Even before a great crowd he would make but a mediocre impression because of the slowness of his delivery.

What we have just said of Cabussel proves that he has an intellectual activity which is very great. The question now is

what does he owe to this intellectual activity and what are the results which come from it. Is he more attentive? No, and it is interesting to note this. Cabussel has no more voluntary attention than other imbeciles of the same level; rather he has less. Thus in the experiment of repetition of figures, which is one of the measures of the voluntary effort of attention, he repeats only 2 figures; Albert who is about the same level repeats 4. Cabussel is not more successful in the repetition of sentences, and does not go beyond 6 words, which is little for this level. It seems probable that the force of attention is not in proportion to the intellectual activity. Perhaps it may even be that a very great activity is detrimental to the attention, which is the power of co-ordination. It is more difficult to drive six mail coach horses together, than one cab horse; so it seems to us more difficult to co-ordinate a strong activity than a weak one. The differentiation of thought¹ which constitutes the essence of all adaptation, is in our subject wholly independent of his activity because it remains very weak. If a picture is placed before him, he speaks with his habitual volubility, but his comments are childish, and do not go beyond a monotonous naming of the sexes. Exactly like Albert, he repeats "That is a man; that is a woman; there are some men," while we are showing him in succession 16 different pictures. He has barely the beginning of description for one or two of them, as "There they are just sitting down to the table." His definitions of objects present the same monotonous character. Like Albert and so many others, he defines only by use. On the whole, in spite of his activity, his thought does not develop, it does not differentiate itself in view of a better adaptation.

Here is the conclusion which we wished to reach. This conclusion has been already anticipated in studying the normal state, where one often has the opportunity to make a distinction between the quantity and the quality of psychological phenomena. Who has not encountered persons who busy themselves with a host of questions, have a great deal of information, speak of everything with warmth and an inexhaustible supply of words, are fertile in views, hypotheses, distinctions, neologisms? Very often they deceive as to their true value. They are thought very

¹ We allude here to experiments of which we shall speak farther on.

intelligent, while in reality they possess only intellectual activity. In mental alienation we encounter certain cases where the intellectual activity may be great, but the level remains very low. This is often the case in maniacal excitation. This is characterised by enormous expenditure of gestures and of words, which constitutes indeed intellectual activity, but the words have scarcely any sense, and follow one another only according to the caprice of the phonetic organs, or an association of ideas scarcely thought out. The contrast is sometimes enormous between the verbal exuberance of such patients and the weakness of their minds. These facts are known by alienists but the distinction which we make between intellectual activity and the intellectual level has not always been recognized. In fact, the error of confounding them has sometimes been committed. One must remember that the faculty of adapting oneself is the property of the intelligence and that the power of adaptation is the measure of it; it is evident that from this point of view any confusion between the activity and the level is impossible.

IX. NUMBER SENSE AND THE ARITHMETICAL FACULTY

According to the general opinion current among competent authors, imbeciles have no notion of number. To us this statement seems too absolute to be exact.

When one talks with imbeciles, he notices that even small numbers give them no exact ideas. Certain ones, like Victor, who have an extended vocabulary, cannot even count their fingers. We ask Victor,

Q. How many fingers have you?

A. (Opening his hand) Three.

Q. On the other hand?

A. Seven.

Victor, by the way, replies in the most imperturbable manner to any question asked him, even if it be hopelessly beyond his intelligence or degree of instruction.

Q. 6 from 19 leaves how many?

A. Two.

Q. 2 and 1, how many is that?

A. Two.

Q. 5 sous and 1 sou, how many sous does that make?

A. 1 sou.

He is never embarrassed. Albert is equally absurd although he knows more.

Q. How many fingers have you on the right hand?

A. Five.

Q. Altogether on the two hands?

A. Six.

Q. How many eyes have you?

A. Two.

Q. And how many ears?

A. Two.

Q. 2 eyes and 2 ears, how many ears does that make?

A. Three.

To Victor who does not know how to tell time, we say showing the clock, which points to half past five:

Q. What time is it?

A. It is exactly four.

That last reply is a little gem.

In the same way they give us the most extravagant figures concerning their age; and by pressing them a little, they can be made to make enormous errors. Victor willingly admits that he is one hundred; and Albert assents to our affirmation that Dr. Simon is eighteen hundred years old. Such observations have given the idea that imbeciles have no notion of number. Nevertheless the errors which they commit can be easily explained in two ways, which are quite distinct from the development of the arithmetical faculty. In the first place, they do not understand the precise meaning of the names of the numbers, these names do not waken in them any but the vaguest ideas, and consequently the crying absurdity of certain replies exists much less for their intelligence than for ours. They are like ignorant persons who say rude things, by using haphazard words from an unknown language; their only error is that of employing words whose meaning they do not know. In the second place, their defective manner of replying is aroused, and should be excused, because of their desire to please us. Imbeciles of the rebellious type, when asked something of which they are ignorant, as for example the number of fingers on the two hands, reply readily, "I do not know."

Our studies have led us to propose the following distinction. In the arithmetical faculty there are two operations: the one sensorial, consisting in the perception of pluralities in concrete form, that is the number represented by the objects; the other, verbal, consists in applying the names of numbers to these pluralities, in counting them, and in making numbers undergo various arithmetical modifications. These two operations are distinct one from the other. The first is animal, in the sense that it is found in a rudimentary form among creatures deprived of language. The second is more especially human, because it presupposes the intervention of language for naming the pluralities, from whence has come the whole development of the ideas and operations which constitute mathematics. From not having

made this distinction, naturalists have committed a grave error; they have supposed that the higher animals have no notion of number, or at least cannot count beyond 3 or 4, while man can count numbers indefinitely great; this is not correct and the contrast here presented, gives rise to confusion. If man with a certain development possesses the conception of number, he owes it very largely to language; deprived of the service which the word renders, it is probable that he would be unable to count even small numbers.

Let us make use of this distinction in order to study among defectives the state of their number sense. We shall begin by considering the animal, sensorial faculty, that which dispenses with language.

Some time ago, one of us experimented with children of from 3 to 5 years, before they had learned the names of the figures, to see if they could nevertheless recall a number of similar objects. We put upon the table sous, or beans, in a group, side by side, without forming any figure, then we said to the child, "Look and see how many there are." Sometimes we put 3 or 4, sometimes 5. Then taking all these objects in our hand, we deposited one on the table, saying, "Are there any still in my hand?" Same question for the second, third, for all; after several tests made with many precautions, we learned how many objects the child could hold in mind. It is evident for instance, that if we had shown 20 at first, he could not, when we placed the 20th, say that was the last. We found that a normal child of five, without the help of language, could retain a number represented by five similar objects. These experiments on animal memory were given to Victor, whom they amused very much, with the following results. We placed 4 single sous in the form of a square. Then taking them in our hand, made the move indicated, demanding a reply for each piece. When the fourth sou was placed Victor declared there were no more. We tried again with five coins, placed on a curve so as not to form a characteristic figure. The same success. When the fifth coin is placed Victor declares, "There are no more."

We took six coins. Failure. The sixth placed, Victor declares there are more.

Same game with seven coins. Success. At the seventh, Victor declares, "There are no more."

Repetition with seven coins. Same success.

Same game with eight coins. Failure.

Repetition with eight coins. Failure.

Thus Victor can retain a number represented by seven objects.

Albert cannot go beyond five under exactly the same circumstances.

We do not suppose after having been informed of such experiments, one could still say with W. Ireland that an imbecile has no notion of number.

Let us now pass to the verbal intelligence of number, something which is strictly human, and see in what state this is to be found among these same imbeciles; it is indeed in a miserable state and nothing is more curious than the contrast between it and the animal faculty which we have just seen in operation.

Recitation of figures and counting. Albert can recite the figures to ten and a little beyond. Victor cannot go quite so far and commits errors. It is not difficult to recite figures; it is like reciting a fable or a prayer; it requires principally memory and but little intelligence. But they cannot recite the series of figures backward, either from inability to make the voluntary effort which would be necessary for this inversion, or through lack of facility in the associations connecting the names with the different figures. Furthermore it is a curious fact that they are unable to count as many objects as they can recite figures. Thus if they can *recite* to 10 it does not follow that they can *count* to 10. Let us see what they do.

Already, the simple idea that they are to count, is difficult for them to grasp. We say to Victor, showing him a bowl full of pins, "Count me out eight pins." He gives us what he can take with his thumb and finger without counting. Let us admit that he does so through carelessness. We continue. Then we ourselves take 10 pins from the bowl, and spread them upon the table, and ask him how many there are. Without counting he replies 5. We repeat, "How many pins?" He answers 4.

At another time Albert, in his turn asked to tell the number, replied 26. Did they get the idea that they were to guess? No. We rather believe that they did not suppose anything at all. A number is asked and they say any one that occurs to them. The number is suggested to them by the question and the appearance of the things, and they do not try in any way to verify it.

But let us oblige them to really count one after the other the pins spread out on the table before them in a row. They commit a host of improbable, unexpected errors of such a nature that it seems as if they did it on purpose. Thus Victor often puts his finger on two pins at once, and counts only one; or again he neglects certain ones and does not count them; or again there is a whole group to which he returns and which, consequently, he counts twice without noticing. Duneize (middle grade imbecile) proceeds in the following manner. The pins are in a pile before her; she takes them one at a time and forms a new pile, and with every pin that she takes she says a number. The result would be correct if she followed this program to the letter; but she forgets from time to time to count one of the pins which she puts in the new pile, so that the total sum is not correct. More than this she does not give the last number which she counts; but any number, haphazard. For example, after having counted 15 pins, she will say 14. Another time, she counted only 5 pins and committed the following error: having reached 5, she continued to count, 5, 6, 7, probably because she allowed herself to follow the suggestion by the continuation of a known series.

It is easy to understand the cause of most of these errors. The necessity of designating the objects as they are being counted and at the same time reciting the series of figures may disturb the memory of the order of the figures, because there is a division of attention. Albert has furnished us a curious example of this. We put before him 6 pins, well separated one from the other. He counts them with his finger while reciting the following series: 1, 2, 3, 4, 6. Having finished he perceived there was one more, at the same moment he also perceived that he had omitted to count 5; there was an instant of hesitation and then he decided, and touching the remaining pin he said, "five, there are five of them." The error is so complicated that it would have been difficult to explain it, and still more difficult to make him comprehend it.

It can thus be seen that to count objects represents a much more complex operation than reciting figures. Let us go farther and see what our imbeciles and morons do with money.

Money. Money gives rise to much more difficult operations than pins do, because pins are unities, while money is composed of units, of tens, of twenties, of hundreds, which give rise, as

we shall see, to operations requiring considerable training. Are imbeciles familiar with, we do not say the value, but the names of the pieces of money? They know them, at least those who are older and have had time to learn them; they know them even better than children of the same mental level, and this is natural because they profit from a longer experience. But their mentality betrays itself especially in this, that they constantly make mistakes in naming the pieces, and give the correct name only once or twice out of three times.

Here are the names given by Victor.

<i>Pieces represented</i>	<i>Replies of Victor</i>
0 fr. 50.....	10 sous (correct)
1 fr.....	20 sous (correct)
2 fr.....	20 sous (incorrect)
5 fr.....	3 fr. (incorrect)
A new sou.....	10 fr. (incorrect)
1 sou.....	2 sous (incorrect)
1 sou.....	1 sou (correct)
20 fr. (gold).....	1 fr. (incorrect)

Immediately the pieces are again shown to him in the same order, and the difference in the replies is very apparent.

0 fr. 50.....	10 sous, to buy tobacco
1 fr.....	20 sous
2 fr.....	20 sous
5 fr.....	1 fr.
20 fr.....	3 fr.
1 sou.....	1 sou
5 fr.....	1 fr.
20 fr.....	3 fr.
1 sou.....	1 sou.
5 fr.....	1 fr.
1 fr.....	20 sous.
0 fr. 50.....	That is to buy a package of tobacco
	10 sous (correct)
2 centimes.....	Ah! don't know, centimes . . . you play me a trick

What must we think of these designations? In the beginning one is disposed to take them seriously, all the more because the imbecile gives them without hesitation, and with a profound assurance; he seems wholly convinced of what he is saying.

One supposes therefore that he has learned incorrectly: that sometimes happens. But it is not what most frequently happens. The general rule is that the imbecile gives any name haphazard to what he does not know, and he does not even suspect this; he has no intention whatever of guessing, nor has he the trick of wishing to hide his ignorance under an air of assurance. He does not perceive that he often contradicts himself; he does not realize that he does not know. He seems even to be convinced that he does know—if it can be that in a mental state so rudimentary as his, one can be convinced of anything.

Let us push our investigation still farther, and ask the value of the pieces of money, how many sous, for instance, it requires to make a franc. Neither Victor nor Albert can reply, or rather the answers which they give are extravagant, and as though spoken at random. On the contrary Griffon, a moron, gives the correct reply every time. Between these two groups of defectives is it possible to imagine an intermediate state? We do not suppose so. We simply think that we might find an imbecile X—who would give nearly the correct value of certain pieces, exactly the correct value of others, and fail utterly on still others. Observation has furnished us a very unexpected type of transition. It is Beauvisage, our young, high-grade imbecile. She belongs to a family engaged in the business of selling crusts of bread for dogs; her services have certainly been utilized, and she must have received money and learned not to make mistakes. In effect, she knows the names of all the pieces of money, and besides she has some relative idea of their value. She cannot say that the 5-franc piece is worth a hundred times 1 sou, or that the 2-franc piece is worth forty times 1 sou, but if we put them side by side she knows positively which is worth more.

Thus she knows that 2 francs is worth more than 1 fr. and she knows that 1 fr. is worth more than 10 sous, and also that 10 sous is worth more than a nickel 5-sou piece. More than this, if we make a pile of 8 sous on one side and on the other side place a 10-sou piece, she selects the 10-sou piece as more valuable than the pile of 8 sous. Here is a curious appreciation of the value of money; we have thought it interesting to note this fact in passing.

Let us come now to the act of counting money; it involves

a great complication, of which we have already spoken. Certain pieces are worth more than others; this is sufficient to bewilder the imbeciles. Thus Albert can generally count correctly a line of a dozen pins spread out before him. This same subject knows the value of a 2-sou piece. Give him sous to count in which there are single and double sous, he makes mistakes because he counts each double sou as a single sou. Five single sous and one double sou are counted exactly as though they made six sous. The nature of the error is curious; it evidently consists in a simplification; it is easier to pass from 5 to 6 than from 5 to 7. Moreover little children make the same mistake.

The centimes complicate the operation still more. We have remarked in the case of Cabussel, high grade imbecile and microcephalic, how dangerous it is to give to these beings any instruction which is not in accord with their degree of intelligence. It is a question of high pedagogical importance, which would need a lengthy explanation. Perhaps we shall return to it later. Here it will suffice to indicate a particular application of it. Cabussel is capable of counting correctly 10 pins, or even 15 pins; if he sometimes makes an error it is slight and caused by a moment of distraction. When he is given a mixture of double and single sous to count, he becomes at once very much embarrassed, grows confused and ends by giving a result ridiculously wrong. This is because he knows the value of the money not only in sous but also in centimes; this is very unfortunate for him; if he knew only the sous, he could, we believe, make the count correctly; but he adds, now sous, now centimes, from which comes an inextricable confusion. A sum of 11 sous, composed of 5 double and 1 single sou, is counted as making 36 sous. A sum of 15 sous made with double and single sous, is counted as making 51 sous, or another time 53 sous. It is difficult to give the details of this operation, because Cabussel goes so fast that one can scarcely follow him, and if you beg him to begin again, he never follows the same operation.

Schematically, one might represent the work which he executes, by employing the following terms: he counts, "1 sou, 2 sous, 3 sous, 4 sous, 5 sous;" so far it is correct; then he encounters 2 sous, which he counts for 10 centimes; he adds 10 centimes and 5 sous which make for him 15 sous, and so on. Arrived at the highest figure, he says one time that they are sous, at another

time centimes. In truth it is a pity that any one took the pains to teach this imbecile the value of money in centimes! What trouble, what effort it must have cost! And with what results! He counts very much worse than if he had remained ignorant.

Many more observations might be made. We shall stop with this one, which was suggested to us by Lanterie, a high grade imbecile. She can count quite well a mixture of single and double sous, or at least when she is wrong, her error is slight. Thus, there are 4 double sous, and 2 single sous; she counts 10 sous correctly. Nevertheless if one asks her a question of abstract addition, for instance, "How many are 3 and 2?" she shows herself incapable of adding 2; she succeeds in adding 1 but not 2; out of 6 questions of this nature she made 4 mistakes. It results therefore that it is more difficult to make abstract additions of 2 than additions of double sous. In the latter case, the attention is doubtless better fixed and more affected by the concrete character of the experiment.

It can easily be seen that our imbeciles are not brilliant calculators; all the examples that we have cited are full of curious errors which they commit; and what completely proves that their arithmetical faculty is but little developed, is that sub-normal children, whom we have brought together in the special classes, are all weak in number work, much weaker than in spelling or reading.

There exists therefore a remarkable contrast between the animal and the verbal intelligence of number. Victor, who cannot correctly count 4 sous placed on the table, shows a surprising ability in the little game with the hand which consists of counting them without counting them, so to speak, having only a simple sensorial idea of their number. This ability resembles that which they show in comparing lines, weights, and even in perceiving the distance and the position of objects. They have without any doubt some of our sensorial faculties; these are as acute with them as with us. That which is specially lacking is the word, the key to abstract ideas and general conceptions.

X. REASONING

THE INTELLECTUAL ACTS IN GENERAL

We shall now study how our defectives perform certain intellectual acts. These intellectual acts consist in understanding, judging, explaining, defining, developing, inventing, imagining, deducing, demonstrating and in accomplishing a host of other operations which have for their object directly or indirectly the solving of problems; because real life proposes to us questions without ceasing which are like barriers opposing themselves to our activity; our intelligence spends itself in finding a solution to these problems; if it cannot solve them more or less well, we cannot adapt ourselves.

It is clear that, in preceding pages, we have also been studying intellectual acts. To find the longer of 2 lines or the heavier of two weights is to compare, to judge, to comprehend. There is some intelligence in all our acts; only the proportions of the difficulty vary; we have created up to this point, very slight difficulties; we shall now consider greater ones.

All these difficulties may be reduced to the following formula: given one element, a , the problem consists in finding another element, b , which completes it. This can be explained by several different examples of which we shall cite only three. A question is put: "What is a horse?" This question is the element a . In finding the suitable definition for a horse, the element b is furnished. In the same way we present to someone a picture representing persons seated around a table, upon which are glasses. The picture represents the element a . In giving the subject of the picture, in saying it represents a drinking scene, the element b is furnished. Last example; "Game of patience." Pieces of a card are shown with the instruction to reconstruct the card by putting the pieces together in the proper manner. The reconstruction is the end, the element to be found, element b ; the data of the problem form the element a .

Pictures. For the perception of pictures, defectives behave almost exactly like very young, normal children; we fear we shall repeat what we have elsewhere said of the latter¹ if we report in detail all that we have found true with imbeciles; but the study is so important for explaining the insufficiency of imbecile thought, that we shall be pardoned if we go back to it. The defective is fond of pictures; the picture is an excellent test, which catches his attention and amuses him, and when necessary dissipates his ill humor. In general the picture does not hold his attention long; he quickly exhausts it, and he wishes to see another. If he is asked to describe the picture presented to him, he does not reflect long; he finishes his description in a few words. The number of words that he uses might almost measure his intelligence. A middle grade imbecile, Duneize, to whom we show a collection of 16 pictures, gives on an average 2 words to a picture. A higher grade imbecile, Albert, gives 8 words on an average, while Griffon, a moron, employs an average of 20. It is nevertheless the same collection. All this proves that one interests himself in things only in the measure in which he himself is intelligent; in other words, our interest in things comes from what we put into them as much as from what they offer to us.

As to the nature of the work done on the pictures by defectives, it shows the same stages as among normal children. The lowest intellectual type is that of the *enumerators*, those who content themselves with briefly naming the principal objects which they see. Nearly all imbeciles belong to this type, but with a well-marked selective tendency. We have never encountered one who, like certain insane subjects mentioned elsewhere, described a picture from left to right. All our imbeciles go directly to persons, and what specially interests them is the sex of the persons. "That is a man—There are men—That is a woman—Those are women, etc." These are the replies that we most frequently receive, for pictures which contain many other things; from time to time, but more rarely, they designate animals, horses for instance and dogs, but the subject of the picture is passed by in silence. The imbecile does not bother himself to know "what that signifies." He concentrates upon the in-

¹ The Development of the Intelligence among Children.

ventory of persons; this brevity does not however prevent him from making many errors. One of them, looking at a scene of insurgents, where there were more than thirty persons, said "That is a man;" another looking at a picture of two men fighting, took one of the men for a horse, and said "There, that is a man, a man who is on horseback," and so forth. It can be seen that even in limiting oneself to enumeration one can make mistakes.

A stage higher, the enumeration mingles with *description*. The position of the person is noted with the action. Then among the more intelligent, generally the morons, there are true descriptions expressed in complex sentences. This we believe is the limit; the moron does not go beyond descriptions, he never rises to general *interpretation*. Interpretation is a matter for normal intelligence.

What do these experiments upon pictures prove? Two principal facts, as we believe; first, the astonishing resemblance between our imbeciles and normal children very much younger; besides this, a certain lack of intelligence and of comprehension which results in our imbeciles not entering into the meaning of the picture as they should. They stop at the first and most elementary image that presents itself to their minds; they see in the picture only the most apparent objects, those which are the most striking to them, and they do not at all attempt to divine what is not seen but which is only suggested. *Theirs in an intelligence that lacks penetration.*

Definitions of words. Here is another subject upon which we do not wish to expand because it is treated elsewhere² in relation to normal children and it turns out that our defectives give definitions that are absolutely analogous to those of children.

Let us be brief. Recall the fact that normal children according to age and intelligence give three sorts of definitions.

1. Simple repetitions: a chair is a chair.
2. Definitions in terms of use.
3. Definitions in terms superior to use: A chair is an object, a piece of furniture, it is made of wood.

Among our defectives we find especially an abundance of definitions in terms of use; and they are such that if one did not

² The Development of the Intelligence among Children, p. 104.

know the personality of those who gave them, they would be unhesitatingly attributed to normal children.

Here are the replies of Victor, all by use. Victor, let us recall, is an imbecile fifty-three years old.

Q. What is a house?

A. To sleep in.

Q. What is a fork?

A. To eat with.

Q. What is a mama?

A. To eat.

Q. What is a snail? (edible snail)

A. To eat, monsieur.

Q. And paper?

A. To write on.

Q. A paper-cutter?

A. To cut paper.

Q. A good trade?

A. Don't know.

Q. A railroad?

A. (Imitates the whistle of a locomotive)

Q. Goodness?

A. Don't know.

Q. Justice?

A. For men.

Q. Virtue?

A. It is salad. (he understood lettuce—la laitue)

Q. Charity?

A. To give bread. (Eloquent simplicity which certainly was not conscious).

Q. Solidarity?

A. To be a soldier. (Was deceived by the similarity of sound)

Q. Work?

A. To dig up the garden.

Q. Ambition?

A. For soldiers.

Q. Hope?

A. Hope is for men.

Q. Gluttony?

A. To drink, and get drunk.

The point of view remains constantly the same, that of use; he sees things in the most ordinary manner and one feels there is no reflection.

The definitions of Albert belong to the same category; definitions by use, with a childish turn.

- Q. What is a house?
 A. A house well a house it is to rent.
 Q. A fork?
 A. It is to eat with.
 Q. A mama?
 A. She is to get ready things to eat.
 Q. A table?
 A. It is to eat on.
 Q. A chair?
 A. It is to sit on.
 Q. A horse?
 A. It is to work.
 Q. A snail?
 A. It is to eat.
 Q. A flea.
 A. It is to kill.
 Q. Charity?
 A. It is those who do good in the world.
 Q. Justice?
 A. It is those who do evil.
 Q. Goodness?
 A. Ah, goodness, it is to get angry.
 Q. Virtue?
 A. (after thinking a long while) I don't know.

The replies of Beauvisage are identical.

- Q. A house?
 A. It is to lodge in.
 Q. A fork?
 A. It is to eat with.
 Q. A mama?
 A. (no reply)
 Q. A carriage?
 A. A carriage is to roll.
 Q. A horse?
 A. A horse, it is to draw the carriage.
 Q. A snail?
 A. That is to eat, snails.
 Q. A flea?
 A. A flea is on dogs.
 Q. Charity?
 A. To beg for money.
 Q. Justice?
 A. (after thought) It supports the world.

The only conclusion which can be drawn from these notes is identical with what we have presented apropos of the experi-

ments upon pictures. It can be seen that they define exactly like a young child. One can also say that they conduct themselves in a very unintelligent manner, because, in truth, to resemble a young child, and to conduct oneself with but little intelligence, are synonymous. The lack of intelligence consists here in a very limited vision; the use of things is evidently what strikes them the moment they think of things; it is what is obvious, what one sees without reflection; and this is why children and imbeciles accept the idea of use and are satisfied with it. Concerning their intelligence let us repeat what we have already said about the interpretation of pictures: *it lacks penetration.*

The "game of patience." The last experiment which we shall cite, chosen from many others, is of a purely sensorial order; it is suitable for those who are not at all brilliant in the exercise of verbal intelligence. We cut a visiting card into ten pieces of the most varied form, triangles and polygons of different sizes. The problem is to reconstruct the visiting card by putting together the fragments in the required order. We place an uncut card on the table and invite the subject to reconstruct a similar one from the pieces. The difficulty of this test is not measurable; it depends not only on the number of fragments but upon their size and form. We have been able, by proceeding in different ways, to make easy combinations, and others very much more difficult. At first sight there seems no directing idea that can be followed as a guide in this game; one must attempt all sorts of mechanical combinations until one happens on the right one. This is not quite true. Notice first that the number of fragments is 10, that each presents on the average 3 sides; the number of sides then is 30; but the number of combinations which one could make with 30 elements is so great that it would take a whole life time to exhaust them. Nevertheless we have seen persons of normal intelligence reconstruct the card in two or three minutes. It must therefore be that the intelligence enters unconsciously into these attempts which seem the most mechanical. But how does this intelligence work? It is difficult to discover. The subject performs a mental operation which in the main escapes us, because he does not speak. The study of defectives and their errors, should permit us to analyse these mental operations. All that we can verify is the intellectual activity of the subject, the reflections that he makes, the num-

ber of his unsuccessful attempts, the manner in which he himself judges these attempts; all this is impalpable as mechanism but proves a mental state of superior quality. This mental state is so important that when it is found it should have more weight than success, which might be lacking. It cannot be demonstrated that every normal person, without exception, must succeed in our game of "patience." There is always chance in the game; one may be thrown out by a bad combination, to which one adheres, or again one may repeatedly pass close to the solution without noticing it. Anyone may have his mind diverted. It would never occur to us to make this game a test of normal intelligence.

Let us notice now our defectives. Duneize, (middle grade imbecile) after having received explicit directions, puts the pieces one after another in a line, like soldiers, and does not even dream of putting them together. One might question if she understood. In any case, the game consists in a reconstruction, the reconstruction supposes a uniting of the different parts. She cannot form even a remote idea of all this.

Albert does better because he puts the pieces together, and attempts to form a figure; but he makes no serious effort; he puts them together haphazard, and the operation once accomplished, he does not change their position, and prevents all possibility of success by allowing them to overlap. His figure presents two faults: the first is that in its exterior form, it in no way resembles an oblong; the second is that in its interior it presents empty spaces. We point out to Albert the two defects of his construction, then we show him the card which ought to serve him for model:

Q. Is it like this? (showing the card)

A. Oh, no, because it is broken there.

Q. But could you not make it like that?

A. (with a convinced air) Oh! no.

This absence of continuation of effort is characteristic of such subjects; they do not make a series of trials and errors, as do so many normals; they dispose the pieces in any order that happens, and then *sit motionless before their failure*, making no further attempt.

Griffon (moron) is more clever, he brings the edges of the pieces together exactly, and is careful not to let them overlap.

In his first attempt, he works completely at random, as though he had lost sight of the model card, and his construction leaves an empty space, without in any way forming an oblong as to exterior form. We point this out to him. He begins again. His second attempt is better than the first, he succeeds in eliminating the empty space and thus his first error is corrected. But he cannot bring the whole to resemble an oblong. After many other equally fruitless attempts, we are convinced that Griffon cannot succeed because he does not improve.

Finally Bard, high grade moron, begins the work with more reflection. She compares the dimensions of the pieces with those of the model; she fills the spaces left by the large pieces then she brings the large ones together, constantly keeping in mind the general form. "I don't believe that that is it," she says, and she begins again, turns and returns the pieces, and finally succeeds.

Here is certainly a simple experiment—child play one would say. But it is on the contrary quite complicated and we shall find difficulty enough in completely analysing it. What we have established is that in presenting the card intact we set a definite end to be attained, that end being to construct a figure having the form and size of the card. One must adapt oneself to that end, and this experiment has, like all the rest which are made in psychology, though in a more marked manner perhaps, the character of an act of adaptation. The different combinations which are made are the means employed to attain that end. During the test the hand is continually directed; there is, as it were an inner critic which counsels us, guides us, prevents us from committing an error or warns us when one is committed. Therefore we make no combination which could create an empty space, or if we commit this error we correct it immediately; in the same way we do not lose sight of the general form, and if some combination causes us to lose the outline we abandon it at once. It is by this direction and this control that we bring our work to a good end, and it is by the absence of control that Albert and Griffon fail; like us the two defectives bring the pieces together and try combinations, but they have not as clear a view of the end to be attained, they do not judge as surely the means they employ; with them, chance takes all the ground which with us is occupied by logic; and since chance cannot alone bring the result they fail.

An analogous explanation answers for other tests of adjustment of which we shall cite simply two: find rhymes for a given word; construct a sentence containing three given words. Here again we furnish a frame to fill, an end to attain; and our defectives fail. Certain ones are incapable of finding any solution whatever; they cannot cite a single rhyme, or they cannot imagine a sentence containing the three words. Others like Griffon, who have more activity of intelligence, find many solutions, but they are false; thus the words they give do not rhyme, and the sentences they form have no sense.

What conclusions can we draw from all this? We do not say absolutely that a defective cannot adapt himself, that he cannot represent to himself the end, and that he does not try to adjust his means to this end. What we do say is that he has not been able to adapt himself to the very special difficulty which we have empirically chosen for him, and that if we diminish the difficulty he will adapt himself. Instead of cutting the card into 10 pieces, let us be satisfied by cutting it into two or three, and certainly Albert would succeed in reconstructing it. There is therefore in all this only a question of degree. The work of an imbecile has this great fault of adopting the first combination which comes, however crude it may be; it is chance which leads him to put one piece near another; he holds to this and does not change the combination even when shown that it is wrong. In other words, he takes what is nearest him, making no effort to look beyond; his intelligence, let us say it once more, *lacks penetration*.

Let us content ourselves for the moment with this expression. Later, at the end of the work, when we set forth a scheme of thought, we shall return to this analysis and push it farther.

XI. SUGGESTIBILITY THROUGH DOCILITY

If, according to our custom, we attempt to divine the facts before investigating them, and consequently conjecture the influence that age and mental development might exercise upon suggestibility, we shall make two preliminary remarks. In the first place, it is incontestable that inferior beings have less judgment than superior ones, and we have seen by many examples how often imbeciles lack judgment. Since it is by the accuracy of his judgment as much as by the quality of his character that an individual combats the judgments of those about him, we shall expect to find that those who lack judgment are more credulous than others. Besides every one knows that the child is more credulous and more suggestible than the adult. The "why" of his curiosity is readily satisfied with the first "because" that comes along; and nothing is easier than to impress him, intimidate him, and render him obedient; however unaccustomed one is to school children, one must recognize that the power of direction which is exercised over them is made possible by their age. All these considerations lead to a provisional conclusion, which is this: it is probable that suggestibility, other things being equal, must decrease as the intellectual level rises.

Is this true? Yes, certainly. But observation will give us some instructive details. It will show us first and above all that two forms of suggestibility exist, the one only apparent, the other very real.

To appreciate the suggestibility of a person, one must be able to compare him to some one else taken as a type, who has been submitted to the same influence. It will not suffice to reproduce examples and incidents of suggestion accomplished; that might be amusing but it does not constitute a criterion. One must find out whether an imbecile placed under the sway of the same suggestion as a normal, reacts in the same way, or with more intensity or with less.

Several years ago, one of us published methods for submitting a waking adult to suggestion and for measuring his suggestibility.

Many of those methods are not applicable to an imbecile, because they require an amount of intelligence and of attention that he does not have. Thus there is one method that consists in copying lines of increasing length presented separately; the subject is so impressed, after a time, by the regular increase that when presented with lines equal in length to the longest, he believes them to be still increasing and draws them constantly longer and longer. Albert is not sensible of this increase in length, because he does not notice it, in fact when a line is given him to copy, he pays no attention to its length; and if two unequal lines are shown him, the inequality does not show itself in his copy. One cannot be surprised then if he remains insensible to the increased length of the lines. In order to subject an imbecile to suggestion, one must place oneself at his level. Without this precaution one would be in danger of believing that an imbecile is not suggestible, and that would be the very opposite of the truth.

Another method which we have before indicated for the study of normals, succeeds equally well with imbeciles. One shows them for a certain length of time, a card-board presenting a great number of objects and designs; then one questions them upon their incomplete recollection, introducing into the questions numerous snares for suggestion; for instance, one makes use of an alternative question; the stamp that was shown was green, and one asks, "Was that stamp red or green?" or one asks the shape of the hat worn by a person who in reality was bare-headed. An adult, submitted to these leading questions, does not notice that he is being pushed gently in a definite direction, and that a hand is being laid upon his thought; this action remains unconscious or more often semiconscious. He has a vague feeling, of uncertainty, of uneasiness, almost of embarrassment; and from time to time, he resists the suggestion completely, or else he escapes by an expression of doubt, analogous to this: "I do not know; I cannot recall exactly." One can thus count the number of snares he has avoided and approximately measure his suggestibility. It is a measure, because on the one hand, all the questions are written in advance and the experimenter does not change a single word, and on the other hand, one knows the average number of snares avoided by the subjects. In general they avoid a good half.

Albert, our imbecile, fell promptly into all. His suggestibility

is much greater than the average for adults; and what is more, he has none of those states of doubt and uneasiness so frequent among normals. He replies immediately, without hesitation, and with a perfect tranquillity. Beauvisage, notwithstanding her rebellious character, comes under the influence of the experiment and falls into the snare many times, though rather less frequently than Albert.

It is evident that these methods, arranged for normals, are too delicate for imbeciles. They must have less delicate ones and we are going to present a series of tests which we have devised for them, and which are for them like garments cut to measure. In order to have terms of comparison we have repeated each test upon other patients in the asylum.

Assent without motive. There is a first sign of suggestibility which is easy to arouse among imbeciles; it is giving assent to an obscure affirmation or simply to the interjection "Isn't that so?" It is sufficient to look at them and remark with authority these few words "Isn't that so?" even without saying anything else. Immediately they reply "Yes," as though one had proclaimed a truth. It is a sign of suggestibility which can be brought out among school children, especially among those very young, from seven to eight years; toward fourteen years, a pupil often remains unmoved, does not reply, or looks at one in an astonished way, or even demands an explanation.

The re-filling of a box. We have here the same compliance in following an order the repetition of which would give offense to a normal. If one overturns a box of pins before them and says, "Gather these up," they gather them with whatever skill and activity they may possess. When they have finished, we overturn the box again, and scatter the pins on the table; one does not even need to renew the order; they understand what is expected of them, and they willingly gather the pins up again, without showing astonishment, without asking why they are given such an utterly useless task. They are profoundly serious, and one sometimes sees some choice examples of stupidity. Albert, for instance, gathers up the scattered pins with the greatest care, and is even so scrupulous that as he collects them he arranges the heads to stand together, and holds them between his thumb and forefinger; then when a little bundle is collected, he throws them pell-mell into the box which causes him to lose all

the benefit of the arrangement. How far could one carry this experiment? Albert gathered them up five times in succession and that took nine minutes. At this point we stopped, not because his docility was exhausted but our patience. Albert had not murmured in any way nor made the least observation. Victor gathered up the pins twelve times in succession, without any remark, showing the same docility.

Is this a form of suggestibility peculiar to imbeciles?

Yes and no. Many normals have obeyed us when the experiment was given under special conditions of seriousness and decorum, as when they were sick in a hospital, or called in by a doctor, or when they imagined that there was the interest of study in the exercise, from which a benefit to their health would result.

In fact many dementia patients have obeyed us when we subjected them to this treatment, and have refilled the box a great number of times. Others have resisted, or have made a great many reflections aloud, showing that they sought for but could not understand the purpose of our order. One subject, a victim of senile dementia, was remarkable for his resistance. In a word it has seemed to us that one need not be clearly suggestible to refill the box.

The chair is called a cork screw. One must make the same commentaries upon the following experiment, which seems to realize one of the most daring suggestions. We rise, we take a chair and show it to the imbecile.

Q. What is that?

A. A chair.

Q. Serious mistake! It is not a chair, it is a cork screw. (a pause)
Let us see, what is this? (and we present again the chair)

A. A cork screw.

Q. Upon what are you sitting?

A. Upon—a cork screw.

This test succeeds invariably with all our imbeciles, even the most rebellious; and one can believe that it would require a very low mentality to thus consent to change the name of a familiar object. It is evident that in a company of friends one who attempted to try this experiment would have very little success. But it is altogether different at the hospital and in the atmosphere where we are working. We have repeated the ceremony of this sort of re-naming with very many dementia

subjects who are in no way suggestible; and we have not yet encountered a single one who had the idea of not submitting to our wish. What did these dementia patients really think? Probably that it was a caprice on our part, a lack of seriousness. In any case they obeyed like our imbeciles. Therefore these first experiments of suggestion prove nothing, because they succeed upon a host of patients and probably upon those in health as well.

The suggestion of the dog. We arrive now at suggestions very much more profound, which shock good sense and cannot succeed except where persons are really suggestible.

The suggestion of the dog is a very complicated scene which we do our best to act out. In the first place we talk with our collaborator, and ask him in a loud voice to bring the dog that is in the yard into the room. He consents. We open the door, and call Follette, and allow the imaginary dog to enter, and with many gestures, and much demonstration make him jump upon a chair placed near the imbecile. Then we say to the latter:

Q. Do you see the pretty dog?

A. Yes, monsieur

Q. He is nice, isn't he?

A. Yes.

Q. Caress him

Denise, who is demonstrative, takes the chair, lifts it and brings the seat to her mouth; a great kiss resounds.

With Albert the scene is prolonged, and takes on more breadth, because Albert speaks.

Q. What color is the dog?

A. It is white.

Q. Is its hair curly?

A. No, it is white.

Q. Caress it, why don't you?

Albert passes his hand gently across the cane of the chair.

Q. Here is a biscuit. Make him eat. Does he eat?

A. (after having made the appropriate mimicry, but soberly) Yes, monsieur.

Q. Tell me, my dear Albert, what will you do with this dog?

A. What will I do? I will feed him.

Q. Yes, but do you think you would be allowed to have a dog in this place?

A. Oh, no.

Q. Well, if they scold you what will you say?

A. I could say nothing.

Q. Do you think they would see it?

A. Oh, yes, they would see it.

Q. Couldn't you hide it?

A. Oh! no.

Q. Perhaps you could!

A. Perhaps so.

Q. You ought to give him a little walk about the room

A. (Rising, and whistling to the dog) Come, come!

Q. Take him to the steps.

A. (To the dog) Go to the steps! Go, jump!

We see that the imbecile does not at all develop the suggestion given him. His lack of vocabulary and especially of imagination, render him brief; he keeps the hallucination just as it is given to him. This has very little resemblance to the mimicry and the loquacity of a hysteric under suggestion, especially of (Baret, that brilliant subject of the Salpêtrière, who did not stop short of literature, and made of the least suggestion a romance or a poem.

Griffon (moron) received the suggestion of the dog and accepted it as completely as Albert did. He lowered his head, and seemed very timid. When the dog had jumped upon the chair, Griffon, at our invitation, stretched out his hand toward the chair to caress the dog, but he did it with only the faintest gesture; he seemed abashed by what was asked of him.

It is needless to add that patients, other than our defectives, are not susceptible to this suggestion. An old woman, with senile dementia, before whom we played the scene, looked at us with disdain and shrugged her shoulders. A young woman, who shows that she does not lack intelligence when one can distract her a moment from her maniacal excitement, laughed in our face and said, "I won't do anything." Even a subject very much advanced with general paralysis, showed himself skeptical, "Where is your dog?" he asked, looking under the table; then he sat back saying with assurance, "There is no dog here."

The suggestion of the General. Here is another hallucination which succeeded with Albert. We give it in detail because Albert here plays a rôle more active than in the preceding case.

It is what we call the "hallucination of the General." It is so audacious that we did not dare try it upon any subjects that we did not already know to be very susceptible to suggestion; we should have covered ourselves with ridicule.

We said very seriously to Albert:

Q. I have something very interesting to tell you. A General is coming here very soon. The General comes to see you. Unfortunately Dr. Simon and I are obliged to leave. Will you receive the General in our place?

A. Yes, Monsieur.

Q. Ah! here he is!

We go to the door. An exchange of salutations takes place with the imaginary General. Albert is presented to him. Albert gets up and bows in his turn. The General is made to sit down near him. Albert, never very active, says nothing. But he is serious and is far from laughing or ridiculing. We wait. Nothing happens. As the silence threatens to continue and as, naturally, the General is as far from being loquacious as the imbecile, we whisper to Albert—

Q. Talk to the general, why don't you

Then Albert, in a natural voice, speaks to him, says several words, and seems to wait for a reply, then says more words; we can represent this dialogue of one person in the following manner:

Albert—Monsieur General

The General—

Albert—Monsieur General, things are going very well.

The General—

Albert—Well I worked in the market every morning, I made 20 sous.

The General—

Albert—Yes, I had an employer

The General—

Albert—It suited me very well.

The General—

Albert—And then I did errands, and helped in the house. I swept the rooms, and I acted as porter.

The General—

Albert—That is all, Monsieur General.

We understand by that last sentence that the conversation is finished. It is very impressive. One would think he was in

the presence of some high personage on a tour who visits a hospital and addresses a few kindly words to a workman. That would take place about as Alfred imagines and it is curious that the whole of such a conversation could have been carried on by an imbecile.

In order not to lose this scene, we photographed Albert and the General together. Then, as the presence of the General



FIG. 18. THE SCENE OF ALBERT WITH THE GENERAL. THE PICTURE WAS TAKEN AFTER SAYING TO ALBERT: "THE GENERAL IS SEATED IN THAT CHAIR. SIT DOWN BESIDE HIM AND WE WILL TAKE YOUR PICTURES TOGETHER."

might become burdensome, we made him leave and Albert, at our request, accompanied him to the door, bowing as he left.

In order to know if the memory of this hallucination (admitting that it was one) persisted or if all was forgotten, we questioned Albert twenty-one days after it happened. He remembered everything and seemed convinced of the reality of what was suggested to him.

- Q. What did I show you on that chair?
A. A little dog.
Q. And with whom did I photograph you?
A. With the General.
Q. What was the General like?
A. He was dark.
Q. But his costume?
A. It was maroon.
Q. And his hat?
A. It was maroon also.
Q. What else do you remember?
A. I took the little dog for a walk.
Q. And then?
A. I made him jump.
Q. Here, in this room?
A. Yes.
Q. What was the color of the little dog?
A. He was white.

Are there any limits to this suggestibility? It seems so easy to handle, even without preparation of any kind, that one would be inclined to believe that an imbecile is soft wax. But we are inclined to believe rather that it is their deference for us which makes them so. It is certain that we do not succeed in making our imbeciles do and say all that we wish. Thus Albert consents to be called Victor and when, after giving him a lesson, we ask his name he says Victor. But Victor will not accept this exchange. He refuses to say that his name is Albert. He offers the same resistance for a change in the names of the days. One of our experiment days is Saturday, the day before his sister comes to visit him; as she always brings him a package of tobacco this visit seems to him very important; he knows that it will take place next day and no one can make him change. Hear him speak.

- Q. Is today Thursday?
A. No, monsieur, it is Saturday. (laughing in a mischievous way)
You want to tease me.

Albert will not let himself be taken in any more than the others.

- Q. What day is today?
A. Saturday.
Q. Are you sure?
A. Yes, I am sure.
Q. I have heard say it was Friday.

A. No, it is Saturday.

Q. Listen, I am going to prove to you that it is Friday. Yesterday was Thursday. But the day which comes after Thursday is Friday. So you see it is Friday.

A. No, it is Saturday.

Curious resistance in a person who ordinarily swallows the greatest absurdities. Several minutes before Dr. Simon had gone out, and we had said to Albert.

Q. How old do you think Dr. Simon is?

A. I don't know exactly.

Q. Well, about how old?

A. Perhaps fourteen years!

Q. Oh! more than that! Some one told me he is a hundred. Do you believe he can be that old?

A. Oh! yes.

Whence comes this striking difference of attitude? We think we have discovered it. In the first place, Albert, like Victor and Denise, is always ready to acquiesce in what he does not understand. A hundred years is only a word for them, a word void of sense. They do not resist. Besides when one suggests to them a dog or a General one does not run counter to any well established convictions; but they insist upon Saturday because it is the day before Sunday when their relatives visit them, they expect their relatives, and this expectation is important to them; and they know also that a certain piece of money is worth ten sous and they will not permit it to be called anything else. They are therefore in an antagonistic state which opposes itself to suggestion. We shall cite several other examples quite typical of lack of suggestibility.

Q. You know that Dr. Simon has gone

A. Yes (In reality Dr. Simon is there at the table, writing our dialogue).

Q. Sit in his place You shall be the doctor. (Albert gets up, but is embarrassed.)

Q. Sit down in his chair since it is vacant!

In the end Albert does not sit. He does not speak, he seems confused, like a child caught doing wrong.

Another suggestion: a theft.

Q. Here, Albert, do you see that music-box on the table?

A. Yes, monsieur.

Q. When no one is looking go and take it. You will steal it and bring it to me and I shall put it in my pocket. (Albert goes to the table, but does not take the object.)

Q. See here! What are you doing? Why didn't you take it?

A. (Embarrassed) Because I mustn't.

Q. But no one will know you have taken it.

A. The watchmen.

Thus even the most docile imbeciles can resist suggestion when they have some reason for resistance.

Now when they yield, when they believe or seem to believe blindly what we say to them, is it because of the weakness of their mental level? Does their suggestibility depend upon their intelligence? One might think so; and we admit, moreover, that there is a partial truth in this supposition. But the principal factor of their suggestibility is not their intelligence but their docile character. The proof of this is that we have encountered imbeciles less intelligent than Albert, who refuse to yield to our suggestion. Cretin would not even look at the dog; and Beauvisage, asked to caress it, replies directly, "There is no dog." This is sufficient proof that the suggestibility of Albert does not come from his mental level but from the deference which he has for us. But can deference render any one susceptible to suggestion? This is a delicate point. If the preceding interpretation is correct, it leads to the following conclusion. Our imbeciles have done for us what we asked simply to give us pleasure, and as for the hallucinations of the dog and the General, nothing proves that they really existed. Their entire mimicry may have come from a desire to be agreeable. An American, Sidis, has well sustained this last curious and paradoxical opinion, certainly false in general, that suggestions acting upon hysterics determine only one thing, a simulation wholly exterior to the phenomena suggested. This may be true of certain ones, not of all, because there are infinite individual variations in the manner of yielding oneself to suggestion. But why not admit the theory of Sidis for our compliant imbeciles?

For a long time we hesitated; in order to decide the question, it must be put in a precise manner and we were afraid to spoil our subject, Albert, by questioning him; because to speak to him of his hallucinations, would be to ask him to analyse them, to give him doubts, to put him in the way of the truth. When the experi-

ments were ended, a month after they were begun, we decided to make this inquiry. In what follows we reproduce the dialogue literally, according to our custom.

Q. Tell me, Albert, do you recall the story of the dog?

A. (He blushes at first and does not reply for a long while, hanging his head).

Q. What color was it?

A. It was white.

Q. And then what else did you see?

A. The General.

Q. What was he like, the General?

A. He was brown.

Q. What did he do?

A. He talked with me.

Q. And then?

A. (No reply).

So far Albert seems to admit the reality of his perceptions. Let us attempt with much discretion to test his convictions.

Q. Very well, that little dog, and then the General, were they people like us?

A. Ah! the General, yes. (He has not understood the point of the question, he wishes to say that we are not like dogs).

Q. But is it true that you have seen him?

A. Yes. (He smiles, his eyes glisten).

Q. Well, why does that make you laugh?

A. Because you talk to me of the General. (Seems confused—laughs as he lowers his head).

Q. But why do you laugh in speaking of the General?

A. It's a joke you played on me.

Here then the truth is out.

Q. But have you seen him?

A. (With hesitation) No, I didn't see him.

Q. But you talked with him.

A. (Hesitating) Yes.

Q. He said something to you?

A. He asked me what I was doing.

Q. You heard him?

A. (Timidly) Yes.

Q. Then you heard him?

A. Yes, I heard him.

Here again it would seem he is under the spell of the suggestion, even though in our questions we put no accent of authority.

Q. Tell me how all this happened.

A. The General talked to me.

Q. But you thought it was not true?

A. (Embarrassment—smile—no reply).

Q. But at the time you thought there was a General there?

A. Oh! no!

Q. But why?

A. Oh, I do not know.

Q. But the dog, you believed that.

A. The dog? Oh! yes, because I know that it is an animal. (Unintelligible reply.)

Q. You thought there was a dog on the chair?

A. (Timidly) Yes.

Q. What?

A. No.

Q. But you caressed it You put out your hand like that You were only making believe?

A. I don't know.

Q. Was it to please me that you made believe?

A. To be sure.

Here at last is the confession. We can only judge it by an impression of the whole. We believe that Albert was never duped. And now he is a little ashamed of his compliance and is in a very troubled and complicated mental state when we question him. He still wishes to agree with us, for he is too timid to resist; hence his contradictions. All the time he tries to divine our thoughts; we could still make him say anything we wished. It is the same with a docile pupil, obedient, industrious, who, called to the Director's office, conducts himself like an automaton. There is therefore a particular form of suggestibility which is wholly superficial, caused by compliance and which depends upon temperament. It is what might be called docility.

It is important to emphasize this, because the error that we have been upon the point of making, other alienists have made. Kraepelin, for instance, has the habit of testing the judgment of certain dementia subjects, by studying their attitude when an absurd affirmation is made to them. One day he asked an old woman, a dementia case, "Isn't the snow black?" And she answered playfully, "Yes, if one puts soot on it," he concluded very justly that the woman did not lack judgment. We think she has also the courage of her opinion. It is not proved by any means that those who acquiesce in an absurd proposition, spoken with authority by a doctor, have fallacious minds; they are rather

the extremely docile, who do not dare contradict. It is important, therefore, when one makes studies upon judgment not to confound false judgment and docility.

Precisely what is docility? One may consider it, as we ourselves have considered it in all that precedes, as an appearance of suggestibility, a sort of simulation of real suggestibility. But it seems to us more philosophical to admit that it constitutes a suggestibility of a particular form. There are, in our opinion, two forms of suggestibility which have not been sufficiently differentiated; the suggestion of hallucinations, of ideas, of concepts on the one hand, and the suggestion of acts, of words, of mimicry on the other. Docility is a suggestibility which shows itself simply in acts, words, attitudes. The fact has escaped notice that the mental conditions of the two orders of phenomena are not the same; the formation of an hallucination supposes not only a false perception, but a suspension of the critical sense; on the contrary, for the execution of a suggested act, it is not necessary to have a consistent conviction. This latter suggestion encroaches less upon the personality. It is not the reason of the agent which bends, it is his will, his character. One may have suggestibility of character without having suggestibility of reason.

With our imbeciles these two forms of suggestibility exist; let us recall the experiments with alternative questions; Albert and Beauvisage are more sensitive to this than some normals; and in this case it is truly a question of a suggestibility which paralyses the critical sense. The intellectual level certainly has an influence upon this suggestibility; it is proportionally high as the level is low. Besides this, imbeciles, at least those who do not belong to the rebellious type, have suggestibility of character, in other words, an extreme docility; and this may cause an illusion in regard to their suggestibility of reason; one can believe that they are credulous and completely duped, when they are simply pretending. We would never have believed that imbeciles could have thus played the comedy of complacency with such a serious air. In truth the moral of this story of the General is that we believed we had deceived an imbecile, whereas it was the imbecile who deceived us. And with modesty we apply to ourselves the ancient saying of Merlin the enchanter, "Whoever seeks to deceive others often deceives himself."

XII. HOW A MORON CAN HAVE L'ESPRIT FAUX

One of the most curious of the psychological problems which are set for us by imbeciles is that relative to the development of their judgment. It goes without saying that imbeciles have but little judgment, but do they make errors of judgment? Or, to speak in a general way, does mental evolution proceed by successive steps in which one finds at first an abundance of false judgments, then little by little, more correct judgments? Suppose two beings A and B who are at very different mental levels. If A is inferior to B in intelligence will he be more liable to false judgment? That is the question. Without hoping to answer it entirely we shall try to look at it closely by studying a very curious defective, named Griffon.

We have often spoken of him; it is necessary to indicate briefly his intellectual level, in order to allow the fallaciousness of his mind to be better appreciated.

He is a moron and not an imbecile, because he can read; he reads fairly well, with good intonation; he writes from dictation and spontaneously; he can compose a coherent letter by himself if one gives him the subject; he makes many mistakes in spelling, but one can understand the text. In arithmetic he can add, subtract, and multiply; he fails in a problem of proportion. This puts him at the level of instruction of the second year of our elementary course; it is about the level of a child of eight years. But he also knows a good many things that are taught in the higher grades and even many that one learns only later in life. As to instruction he is, therefore, far superior to an imbecile; but he is not a normal. A normal might have had less instruction, but he would succeed in the psychological tests in which Griffon fails.

In fact Griffon cannot arrange five weights in order; he cannot succeed in "the game of patience," nor find rhymes, etc., tests easily passed by children of from eight to ten years.¹

¹ We refer to some results furnished by our measuring scale of intelligence. (See "The Development of the Intelligence of Children," p. 182.)

Socially also he is a moron, because he lives at the expense of his family and is not capable of following a trade. He has been hired as a laborer by many different employers and has been regularly dismissed at the end of two or three months. For a long while he has stayed at home where he busies himself in cleaning the apartment. He is of a good disposition, but selfish,



FIG. 19. GRIFFON, MORON TWENTY-EIGHT YEARS OLD; MENTAL LEVEL OF A CHILD OF EIGHT YEARS.

and shows a decided aversion to women. He has no vices and does not drink. His chief occupation is reading; he loves reading, even reads at night; so strong is this habit that if he has a book in his hand he will continue to turn the pages even when it is quite dark. We have this information from one of his relatives. If he were not a moron we should say that he was "*un intellectuel*."

We have spoken of him as an extraordinary case of fallacious mind (*esprit faux*). This is a mental type which is rarely to be met with in such a degree of perfection even among imbeciles and morons. Many of them have a lower level than Griffon; they have never been able to learn to read; but they do not talk so much nonsense. Intellectual inferiority, and what may be called a fallacious mind (*esprit faux*) are therefore two very different mental states; the first, at least, can manifest itself independently of the second.

From the very beginning of our conversation with him Griffon utters a whole swarm of absurdities. Listen to him. We ask him to tell us about his apprenticeships; he replies that he worked two months with a baker.

Q. Why did you leave the baker?

A. Someone was needed to take my place.

Ridiculous reason! He takes the effect for the cause. He remained several years in Paris, living at the expense of his mother and not even attempting to find a place to earn a little money. We ask him:

Q. Why did you not find another place in Paris?

A. We thought of returning to Chalons As I had still 28 days to serve and 13 days

Thus it was for such a motive that he remained doing nothing until he was almost thirty; because it was a question of leaving Paris to return to Chalons, where he had a military term to complete!

He has served two years. We questioned him in regard to this.

Q. Were they sometimes cross to you in the regiment?

A. Oh, no, monsieur. We went to exercise twice every day.

The reply has no bearing upon the questions. We ask him other questions about his family.

Q. How many brothers and sisters have you!

A. I have three brothers and one sister.

Q. Give me the names of your brothers.

A. Eugene Griffon, Armand Griffon, Valentine Griffon.

Q. Eugene and Armand, that makes only two brothers, and then? Who is the third?

A. It is I.

He is therefore his own brother. We ask him many questions in order to find out the amount of his information. In certain cases his errors can be attributed strictly to his ignorance, for instance when he tells us that Paris is the capital of the "Côte-D'or." It is, however, very serious ignorance. But in other cases the absurdity is undeniable, because he contradicts himself.

Q. Who is the president of the Republic?

A. M. Carnot.

Q. What?

A. At Lyons, assassinated by Ravailac, no, Cesario, in the month of June, '94.

Q. He is still president?

A. No, he is dead.

Q. Who has replaced him?

A. M. Félix Faure, who is deputy.

Q. But now? Who is president of the Republic?

A. It must be M. Casimir-Perier.

Q. He is still president?

A. Oh, I don't think so. He must have resigned.

This is not ignorance, since he is quite well instructed; it is a singular error to name Carnot, then Perier as actual president; then add that one is dead, and that the other has resigned.

Q. You read the paper?

A. Yes, monsieur.

Q. You are interested in it?

A. I read about the accidents and the concerts.

Q. Politics a little.

A. Yes, Monsieur.

Q. What are your political opinions?

A. Catholic.

Q. And then?

A. Protestant.

Q. And then?

A. Jew.

He seems not to understand the sense of the word and that one cannot be at the same time Catholic, Protestant and Jew. This does not mean that he has not had enough instruction, but he makes a singular use of his instruction.

Q. What river passes through Paris?

A. The Seine.

Q. Where does the Seine empty?

A. Into the Rhone.

- Q. Where does the Rhone empty?
 A. Into the Lionne.
 Q. Where does the Lionne empty?
 A. Into the Durance.
 Q. Where does the Durance empty?
 A. Into the Mediterranean Sea.
 Q. Where does the Mediterranean Sea empty?
 A. Into the Atlantic Ocean.
 Q. Where does the Atlantic Ocean empty?
 A. Into the Pacific Ocean.
 Q. Where does the Pacific Ocean empty.
 A. Into the Indian Ocean.
 Q. Where does the Indian Ocean empty?
 A. Into the Arctic Ocean.
 Q. Where does the Arctic Ocean empty?
 A. Into the Pacific Ocean.

His historical information presents the same incoherence.

- Q. Who is Louis XIV?
 A. He is an emperor?
 Q. Do you know something of him?
 A. He administered justice sitting at the foot of an oak tree. I have
 seen that in a history, going to school.
 Q. What else do you know of Louis XIV?
 A. He was a Royalist.
 Q. What more?
 A. He held the government of the Republic.
 Q. How long were you in school?
 A. Until I was thirteen.
 Q. From what age?
 A. From seven years.
 Q. What do you know of the Revolution of '89?
 A. It was the working man who revolted against the people.
 Q. And then?
 A. They killed themselves.
 Q. And how did it all end?
 A. In a proposition of peace.
 Q. To whom?
 A. To the government.

Notice carefully that in this nonsense there is, however, a basis of instruction.

- Q. Are all men equal?
 A. Sometimes. That depends upon the party to which they belong.
 Q. For instance?
 A. There are Catholics, Protestants, Jews, clericals, revolutionists, socialists, anarchists.

Q. But are they equal?

A. They are about equal in death.

Q. And in life?

A. They are all about equal. They work together in the field, in the factories of the town, in business.

Q. Is justice equal to all?

A. Yes, monsieur, there must be someone to represent it. We are its representatives on earth.

Q. Who represents it?

A. The man and the woman.

All this is said with the eyes lowered, in a gentle, timid, whining voice. The subject has not at all the manner of mocking us nor of being intoxicated with words. Observe that we do not lead him on to all these absurdities, we do not exercise any pressure over him, we make no suggestion. We know already and have demonstrated before, that in addressing an individual who is at the same time defective and docile (both these conditions are equally necessary) and asking him certain questions with authority, we can obtain from him unreasonable replies. Griffon is no exception to this rule. We could easily induce him to say that his name was Bertrand and not Griffon, that a thief is an honest man and that snow is red, and other absurdities, to which one might readily suppose that he subscribes for the sake of being agreeable. But what we are now describing is a totally different thing. It is the absurdities which we do not suggest, and which come from Griffon spontaneously, and for which he alone is responsible. Let us cite other examples?

Q. Who was Pasteur?

A. A great savant who cured the rabies with the virus.

Q. Tell me more about it.

A. He invented machines for curing the rabies, using animals and rabbits.

Q. And Napoleon?

A. He was an emperor who commanded the army.

Q. Gambetta?

A. He was a savant, a deputy, who represented the republic.

Q. Victor Hugo?

A. He was a senator, deputy, who represented people at the Chamber of Deputies.

Q. M. Thiers?

A. He was a deputy of the Chamber of Deputies in Paris.

Q. M. de Sans-Souci? (Name invented by us)

A. He is a Merry Andrew, who plays the clown in the circus.

Q. The Duke de Trévisé? (Name invented by us)

A. A man who represents a landed property. A reactionary.

Q. M. Durand? (Name invented by us)

A. He is a commercial traveler who deals in cloth.

Q. Ali Bentailo? (Name invented by us)

A. He is a king who represents savages.

Some of these replies are grotesque, others are quite ingenious; the last three, for instance, correspond sufficiently well to the nature of the word we had invented.

Q. Where does milk come from?

A. From the cow that feeds on the grass in the fields.

Q. Do oxen give milk?

A. Not much. They drag the plow, they are made to work in the fields.

Q. Where does ink come from.

A. It is a plant they cultivate in Africa to make ink of in the factories.

We will also cite his remarks upon portraits and pictures. A photograph representing an operatic singer in costume appears to him to be a "harlequin in a boat with oars on a river, going to learn to swim in case of wreck, etc."

Without question of any sort from us, he utters many absurdities; for instance, on being asked to make a sentence containing the three words *Paris, fortune, river*, he does not hesitate to write the following sentence, which has no meaning: "*This fortune of the river of the prairie of the portion of the god-father.*"

Asked to recall the pictures shown to him, he cites two from memory correctly and seven others which he has not seen and which he invents. Asked to name samples of colors, he does so in the main, correctly; but when he comes to a gray tint, he says "tricolor." When asked to recount something which he has just read, he does so without sparing the absurdities. Thus he explains that a man has been *killed* in an accident on the street, and that he has been carried to the hospital *in a serious condition*; or again, reversing the facts, he recounts that robbers had arrested a commissioner of the police, and conducted him to the guard house, while of course the paper stated the exact opposite.

It is clear that in condensing all these examples of absurdities we have made them seem exaggerated. Griffon, in an ordinary conversation, commits fewer errors of judgment than would appear from the above; one can even talk with him during a minute or two, without his making any break. It is when he is asked some-

what complicated questions that he is particularly apt to make these blunders.

This moron has received, as we have said, some instruction; he can read and can write a passable letter; we had him write one to his parents; it was legible, comprehensible, correct, and without nonsense. He counts money well. His memory for immediate repetition of sentences is normal, and rises as high as 26 syllables. His attention is good, and his reaction times although long, are not out of reason.

At first sight one is tempted to attribute all his errors of judgment to his instruction. He seems to have received an amount of instruction out of proportion to his degree of intelligence. It would be a curious example of the results which are obtained in applying the ordinary methods of instruction to an subnormal subject. Evidently Molière was right when he said that "an educated fool is more a fool than an ignorant fool." But it would be unjust to accuse solely the school that Griffon attended until he was thirteen. There is in him a natural, congenital defect, a weakness of judgment; this weakness has been put in clear light by the instruction he has received, but the instruction is not the direct cause of the weakness.

How are we to represent the state of his judgment? The errors of judgment which may be committed are of many different kinds. There are some that are plainly apparent, which come from the inexact use of words; persons suffering from senile dementia, and from aphasia often commit them; they take one word for another, or else forget the beginning of their sentence before they finish it, and hence they make utterly false assertions, of which they are not conscious. Other errors of judgment have a kind of system like those of persons suffering from melancholia or delusions of persecution, who persist in their false ideas, and sometimes even seek to demonstrate them by all kinds of reasons.

The mistakes of Griffon do not belong to either of these categories; they are errors of judgment very much more nearly akin to those which we normals commit. The mechanism of these errors seems to consist in a lack, a failure of evocation of the reasons which would show the falsity of the affirmation. It is what is called *n'entendre qu'une cloche*. How often, in fact, we accept the first idea that presents itself. How easily we allow

ourselves to be prejudiced against people because we accept what others say *against* them, and we do not even think of what might be said *for* them. One could also attribute this error of judgment to negligence or to distraction. In any case, it is like a judgment by default, because the opposing party is not represented at the hearing. In each instance one might rebuke Griffon because he had not paid sufficient attention. Thus he does not notice the blunder he made when he counted himself among his own brothers; he does not notice that he absurdly calls a gray tint "tricolor;" he does not see that in putting three words into a sentence he has written something without sense, nor that he replies to a question which is incomprehensible for him, nor yet that he contradicts himself when he says that Casimir-Perier is actually president of the Republic, and that this same Casimir-Perier has resigned, etc.

What proves that he fails through lack of attention, lack of reflection, let us say through lack of control, is that he knows enough to correct himself, if he applies himself. Thus, searching for the name of the tint gray he says "tricolor." If some demented person having a fixed delusion, had made this error, he would have explained it in a logical manner; for instance, by insisting that every color is truly tricolor, because it is made up of three fundamental colors, and other absurdities. Griffon said it without even noticing it; the proof of which is, that a month afterwards when we ask him the meaning of the word tricolor, he replies "The French flag is tricolor." We ask him again, "If we say that a table is tricolor what does that mean?" "That means," says Griffon, "that it is variegated." Evidently, the first time he had used incorrectly, without noticing it, a word whose meaning he understood. Another example: he said to us that at the time of the Revolution, the laboring class fired on the people. This is not a positive error of judgment, it is again a lapse, because on another occasion, when we asked him of what the people is made up he replied that the people is made up of the laboring class.

But however innocent these lapses may be, they are nevertheless marks of a peculiar mentality, when they are so abundant as with Griffon; and we have now to put the question which we raised at the beginning of this chapter; is it characteristic of a weak intelligence to commit so many errors of judgment?

We do not think so. We have indeed seen some imbeciles and some morons, whose intellectual level was equal to or even inferior to that of Griffon. None of them, if we except Cabussel, excelled as he does, in absurdities. Albert, for instance, protects himself from insidious questions by a simple "I do not know," and others are silent. This allows us to suppose that the falsities of judgment are not a necessary consequence of weakness of intellectual level; they express rather a discord. This is the way it appears to us. Albert, Victor and many others are short in all their faculties, but their faculties are well coordinated. Without doubt their judgment is weak enough, but so is their imagination and their memory, all is weak, and consequently the intelligence is proportionately low. If it is true that the judgment acts as a check, it matters little that it is weak, since the motor which it must watch over and regulate has little power. On the contrary Griffon shows, like Cabussel, a certain intellectual activity, and even something more, a certain fertility and ingenuity of imagination. Question him and he never remains without a reply. He finds an answer for all, even for those things of which he is ignorant or which he does not understand. He tells you the origin of ink, he defines in the most fantastic manner the word which he does not know. In his inventions he shows some imagination; and there is some merit in his finding that M. de Tréville represents a landed proprietor and a reactionary, while M. Durand is the name of a commercial traveler; it is a work of invention which resembles that of a dramatic author, in due proportion of course. And it is in this slight intellectual activity, in this little gift of imagination that the secret of his absurd judgments may be found; he has too much imagination for his power of control, or too little control for his power of imagination. Truly it is not well for a defective to have too much imagination.

Our general conclusion will be that the particular state to which we give the name of "esprit faux," a state which is sometimes to be found among imbeciles, does not correspond to a regular period of psychological evolution; it is a somewhat exceptional state, which results from a lack of harmony between the inventive faculties and the corrective faculties, like an equipage where the number of reins is not in proportion to the number of horses.

XIII. A SCHEME OF THOUGHT

I. PRELIMINARIES

The general impression which is obtained when one passes some time with imbeciles or idiots is that they are literally "*les pauvres d'esprit*," poor in mind. They do not differ from normals as certain types of demented do, by unexpected and sometimes original and fantastical phenomena which are like extra attachments to a well-known mechanism; the difference is not one of more but of less. The defective is a normal who lacks something.

But in what does this lack consist? If ever the notion of higher processes and of inferior processes had any chance of application in psychology, it is truly applicable to this type of individuals. One feels that it is especially the higher part of the intelligence, the most delicate, the finest that is not developed in them; they are reduced to what is coarsest and, consequently, to what is the most simple, the most elementary and the most general in man.

But this is only a very vague conclusion, and we must try to make it exact. It is curious to see how prone we are to hide behind words what we do not thoroughly understand. The above difference, when it has been employed to express the distinction between man and the animal, has received different names; in man, reason, in the animal, instinct. We have also used and abused the term degree. It has been said that the intelligence of a child differs from that of an adult in degree only. But in exactly what does this degree consist? And what distinction can be made between the difference of degree and the difference of nature? Authors do not agree upon the meaning of these expressions when they attempt to fathom them, which, by the way, they prudently avoid. In short, it is singular that the principle of psychic development should be so poorly defined that no one at the present moment can tell the essential difference which separates the intelligence of a child from that of an adult.

Alienists and psycho-pathologists have at least had the merit of introducing one clear idea into this domain when they have admitted that with many dementia and hysteria cases the various symptoms, delirium, convulsions, strokes, etc., can be explained by two combined causes; the unchaining of *automatism* and the suppression, the paralysis, the inhibition—in a word the putting out of service, of the higher processes. This interesting conception, taken literally, leads us to admit that there exist in us two activities of a different nature, the one inferior, called the *inferior psychism* or *automatism*, the other superior, called reflection, will, the *synthesis* (*la synthèse*). While those, who have pushed this conception farthest and have put the most ingenuity into developing it, have maintained that there are all the transitions possible between these two forms of mental activity, and that we pass gradually from the one to the other, other authors have not taken these reservations into account; they have seen here faculties so different that they have wished to attribute to them a different localization in the nerve centers; there are, according to them, certain parts of the brain devoted to the automatic life, while other centers have the higher functions of attention and reflection, coordination and perception. It has long been admitted that the frontal region of the brain is the seat of these higher processes. Recently, a neurologist, pushing this theory to the limit, has proposed to call the center of this higher life Center O, and he has introduced into the explanation of the psychological mechanism of various symptoms, like aphasia, hysteria, spiritism, and many other cases, the use of this center "O," which sometimes excites, sometimes inhibits the lower centers, sometimes is itself paralyzed, which thus permits the lower centers to develop a hyper-activity without restraint.

Without doubt this hypothesis of two wholly different activities, the one superior, creative, synthetic, the other inferior, conservative, analytic, has already rendered great service to certain phases of mental pathology. Notably it appears to apply to hysteria, to mental dissolution, to obsessions, and to spiritism. But perhaps an exclusive consideration of these types of phenomena has tended towards a certain exaggeration, when one has attempted to form a general concept of the human mind, using this one sided hypothesis as a key.

Without wishing to combat this hypothesis directly, we shall here try to limit it. It does not apply indiscriminately to all types of subjects. It has been extended somewhat artificially to normals. We shall show by an extended study of defectives that it does not apply in any way to them; it does not explain in any way the character of their defects. It would not apply any better to children. In a word, it may be that we have a conception, which is valuable perhaps for certain modes of functioning of the mind; but which is not, however, a general principle of the development or of the genesis of mind.

There exist among certain imbeciles and among the unstable, fantastic ideas, impulses, sudden paroxysms of rage, wild pranks. Possibly one might admit that these episodic phenomena are explained by a bursting forth of this automatic life, that is to say in the modern phrase, a lack of synthesis; let us put it better: a simultaneous lack of coordination and of hierarchy. One may understand from this that these impulses take on so much importance because they have escaped the control of the higher faculties. So be it. But all defectives do not by any means present phenomena of this kind. Besides it is not because they present them that they are defectives. Outside of these accidental troubles they have a peculiar mental state, characteristic of defectives, which is imbecility, idiocy, or moronity as the case may be; and what we insist upon is, that in order to explain this chronic mental state, one has no right to speak of lack of synthesis, as is habitually done; here the expression has no sense whatever, and those who employ it are parrots.

2. DISTINCTION BETWEEN THE FACULTIES AND THE ACQUISITIONS

In the analysis of the mental states of defectives, which we now begin, we shall make a fundamental distinction by which many subsequent misunderstandings may be avoided. We must not confound our mental faculties with the practical results, knowledge, acquisitions and powers of all sorts, which, thanks to these faculties, we acquire.

The practical acquisitions are of the following order; reading, writing, arithmetic, professional skill, the manner of gaining one's living, etc. This is a matter of *instruction*. The mental

faculties are what are commonly called attention, memory, judgment, reasoning, abstraction, etc. This is *intelligence*.

The practical results obtained by a defective evidently depend upon his intellectual faculties, and also upon his character, as well as upon the environment in which he is placed; and, likewise, the dependence upon the intellectual level is so close that we believe it to be possible, when we observe a subject of a certain level, to foresee for all time, whether he will be incapable of learning to read. There is, therefore, an important relation between the intellectual faculties of an individual and the practical results which he may obtain from them. It is the same relation which exists between a science and its applications. But, if one wishes to compare any individual with the normal type, from the point of view of his intelligence and to discover thus how far inferior to the normal he is, one perceives that the comparison is put in very different terms, according as one's point of view is the practical result or the intellectual faculties.

Taking account only of the practical acquisitions, that is of instruction, we find an absolutely clear difference between the two subjects. The normal child of seven years can read hesitatingly; an imbecile even of twenty years cannot read, and can never learn to read. This is an excellent criterion for distinguishing one from the other. Reading is a barrier which will separate them for all eternity; it is moreover a limit which suffers no distinction of more or less, it is absolute. One can come to an understanding on this point because it is a question of fact, and our understanding will be clearer if we take the pains to define what we mean by reading; if we distinguish the pronouncing of syllables from hesitating reading, and this from fluent reading. We could cite also as an example of a practical result, the use of speech. We have said that speech does not result from a faculty, and that we do not possess a faculty of speech, as we do the faculty of paying attention, or of memory.¹

Speech is an application, a practical result of our faculties comparable, for example, to the art of playing chess; and indeed if we take the word art in its technical sense, we might say with perfect truth that speech is an art. Let us repeat that speech belongs to instruction. Besides, speech serves as an excellent

¹ See *Language and Thought*, Part II, this volume.

criterion for distinguishing a whole group of defectives; idiots are mute, whereas imbeciles speak.

Let us turn now to the intellectual faculties and see if they can furnish us with an analogous, distinctive criterion. In other words is it possible to cite known mental faculties which belong to normals and are not to be found among defectives? Formerly this was believed, and certain authors believe it still; but this is because they have submitted their subjects to incomplete observations. Let us make an enumeration. Is the defective radically incapable of attention? Evidently not. We have proved, even with idiots, that they give undeniable evidences of attention. Recall the idiot Vouzin, who looks at us a little especially when we call him loudly, and who for a moment even showed spontaneous attention, when he took the music box from our hands. Is it memory that is lacking? Not that either. We have noted many instances of prolonged memory among them. Denise, the poor girl, remembered for several days the object that we had called "Papa."²

Are they strangers to the notion of number? This has been believed, because they employ at random the names of numbers which they do not understand; but some precise tests have shown us that they have a distinct consciousness of plurality even when they cannot name it. Is it then critical sense, judgment that they lack? Certainly judgment often fails them; or rather they can be placed in certain conditions where it would require a particular degree of judgment for them to be equal to the situation, and they cannot attain it. But in other cases they certainly show some judgment, for instance when Albert refuses to be the dupe of a suggestion. We may thus pass in review all our faculties, and determine that not one is entirely lacking in them. They always have them in some degree. The arsenal of their intellect is equipped with all the weapons.

Another means of arriving at the same conclusion consists in repeating an experiment that had been attempted by them but in which they had failed; let that experiment be simplified by replacing it with another of the same nature but easier, and the defective immediately takes his revenge. A certain movement cannot be accomplished in ten seconds; he does it in twenty

² See *Language and Thought*, Part II, this volume.

seconds. He cannot repeat four figures; but he can repeat two. He does not understand a certain sentence; but he comprehends another that is shorter and less complicated. He fails in a "game of patience" formed of ten pieces; he succeeds if the number of pieces is only three. Sometimes it is not easy to simplify a test; but every time that it is reduced sufficiently, one can be certain that the defective will be able to succeed.

This truth, verified repeatedly, frees us from the necessity of undertaking an investigation whose result can be foreseen, or of putting any questions which seem on reflection to be useless or without sense. Thus there is no need of asking whether or not an imbecile has any esthetic sense. He will always have at least a trace. Show him two figures, one pretty, the other ugly, and he will be able to make a distinction between them if you carry the degree of deformity far enough.

All this leads to the conclusion that the difference between the defective and the normal is not produced by the absence of a particular faculty, and alienists who in their definitions have seemed to insinuate the contrary, have deceived themselves. But these are all very negative conclusions; and now, after having said what is not, it is time to say what is.

III. THE DIRECTION OF THOUGHT

In order to group all the facts collected we are going to present an hypothesis; this hypothesis cannot explain everything nor cover everything; we shall limit ourselves to considering a single side of the question, the intellectual side, leaving for another time the study of the instincts and the emotions. In a word, we are going to present a *scheme of thought* and show how this scheme can explain the differences which we have encountered in the intelligence and bearing of a defective, and also to explain exactly in what the evolution of the intelligence consists. Our scheme should represent not only the mechanism of the thought, but its evolution. Here we arrive at the culminating point of our study, at the important general idea, which gives the evaluation and the summary of all the little observations in detail.

Whenever one has tried to define thought (we take the word here in its broadest sense), there has been a general tendency to give too great importance to mental images, thought being

thereby reduced to an act of contemplation, the contemplation of an image. But many observations, experiments, and reasonings have shown us that thought is not a passive state, but rather a system of actions. James has repeatedly insisted, as we ourselves have done, upon the possible existence of conscious thought which is produced without the aid of images;³ and on the other hand it has been shown that to think does not consist solely and passively in taking cognizance, but in trying, in feeling one's way, in choosing. All these preliminary views can take a more exact form, thanks to the following scheme.

Thought, as we believe, is composed of three distinct elements; a *direction*, an *adaptation*, and a *criticism*. These three elements characterize a complete thought, but they may be lacking in an incomplete thought. In order to make our description better, let us suppose a thought to be as rich as possible, very much richer than it is in reality; we shall do as an author does who, wishing to describe a regiment, describes without exception all the possible auxiliary exercises, even those which never coexist in the same regiment.

First *the direction*. To accomplish with consciousness and surety an act of thought, we must first know "what it is about." We take, for instance, a problem in addition; we know that we must add, we have constantly this idea of addition in our minds, and it is necessary, because this idea produces an effect upon every figure with which we operate; we encounter for instance, a figure 3 and a figure 7, written one over the other; one might multiply them, subtract them or add them. If we add them it is because of the directing idea that we must make an addition. In every experiment with an individual, one commences by giving him some instruction; this instruction, once it is understood, serves as the starting point of the directing idea. It is the directing idea under the most conscious form in which it can be clothed, the verbal form.

Thus we ask one of our defectives, Griffon, to name for us all the red objects that he knows. He complies, and for two minutes busies himself in citing seventeen red objects. There are here two phenomena: the evocation of the names of red objects, and on the other hand, the order which we have given him,

³ See *Experimental Study of the Intelligence*, p. 81.

which he remembers, and to which he conforms. It is this order which serves as a directing state of consciousness. These states of consciousness function continually in us normals. They are veritable orders which we give ourselves. But they are not always conscious orders. In the beginning, when we commence an art not yet learned, we have the full consciousness of the directions we are to follow; the beginner in painting distinctly remembers and can even formulate the numerous rules which he learned from his professor, and which are necessary for him to remember in order to cover every centimeter of his canvas with color. But little by little, the influence of the directing state becomes weaker on the movement of the thought and of the hand. One no longer needs to make an express appeal to the verbal formula of the instructions; it falls into the vague state of an intellectual feeling, or even completely disappears. Some authors have recently made a curious experiment which demonstrates what we have just said; this is accomplished by means of controlled association of ideas. A word is given to the subject, and he must find a second, which stands in an exact relation to the first, for instance of subordination or of superordination. At first the subject is obliged to recall the order; he repeats it to himself, he is even obliged to have it so vividly in his consciousness that he sometimes visualizes it in a way to be his guide; then little by little he thinks of it less; in the end he does not think of it at all; and yet only such words as conform to the instruction present themselves. The directing state, from being conscious has become unconscious: but it is like the manager who from behind the scenes watches and directs the actors on the stage.

These few facts borrowed from the history of our normal life, permit us to know in what the *direction* consists. We also know by personal experience that cases present themselves where the directing idea fails us. We do an errand, we go into another room to look for an object, then, surprised we stop, not knowing what we came to look for. We accuse our memory or perhaps our attention; in reality it is the direction which has suddenly failed us. In dreams, in reveries, we see images succeeding one another, but there is no plan, we do not know where we are tending, there is no purpose, we drift without direction.

Among our defectives, we often encounter an absence or weakness of direction which manifests itself under two different forms;

either the direction, once commenced, does not continue, or it has not even been commenced because it has not been understood.

The direction often grows very weak among imbeciles. We see it when we talk with them. In conversation, intelligent persons are attentive to what we say, they look at and listen to us; what would distract them is repulsed, annihilated, remains ineffective. In a conversation of this kind there is no order given to listen, it is a sentiment of curiosity or of deference which produces the direction. We have seen how this direction may be lacking under certain circumstances with imbeciles and idiots; we have described all these failures in the chapter on attention. Sometimes the direction fails entirely of being established. Vouzin instead of listening to us looks all about him; nothing is coördinated in his case; these psychological elements remain scattered. With others, like Denise, the direction can form itself, but it is very precarious; the current is established, but it is easily diverted; with others the distractions are transitory, and the current may of itself again take up the first direction. We are studying here the formation of a tendency altogether elementary, the tendency to coördination and systematization; it is necessary not only for carrying out an exact psychological experiment, but also, which is much more important, for the adaptation of a human being to his environment.

We have said there are other circumstances where the direction fails through lack of comprehension; speaking in common terms, our imbecile receives an order but does not execute it because he has not understood. This is what happens with a good many of our tests. We tell an imbecile, for instance, to compare two boxes and to indicate the heavier, and he does not succeed. If he does not succeed it is not because it is impossible for him to perceive the difference of the two weights. As we have often proved he can very well perceive this difference; but he is embarrassed by the necessity of making a comparison; he does not understand the meaning of the experiment; he does not see that he must take a box, weigh it in his hand, remember its weight, then weigh another, compare it with the first, decide which of the two is the heavier, and point it out. In regard to this, children show the same embarrassment as imbeciles, they do not understand the directing idea. Here is another example. One may understand, may even begin an action,

then suddenly cease to understand. We have had particular occasion to observe this among general paralytics. An operation is given them to perform, for instance a subtraction; in the middle of it they no longer remember where they are, and begin to add instead of continuing their subtraction. Or again, they have commenced the study of a problem. They have seen that 27 must be multiplied by 36; they do the first part of the multiplication correctly, then they stop, they are lost. It is as though in their heads they had been playing chess and some one came along and hit the chess-board, jumbling the men together. They are obliged to abandon the problem.

Thus one of the first characteristics which distinguishes a superior from an inferior intelligence, is the power of directing the thought; and this power of direction manifests itself in two ways: by its complexity and by its persistence. Let us further remark how the position which we have taken differs from a theory wide-spread in psychology, which gives all the efficacy to the idea, to the sensation, to the movement, to isolated phenomena, while we believe that the first fact, the most important of the psychic life, is a coördination which gives to the current of ideas a definite direction. According to the adherents of the first theory, which we may call the theory of psychic atomism, the attention is only of the one idea, it is a state which results from the isolation of one idea reigning alone in an empty consciousness; a singular theory which would hardly apply to an idiot, because, since it is very probable that the idiot has fewer ideas than the normal, the idiot must approach nearer to that desideratum of an empty consciousness and consequently must be more attentive than the normal. Observation shows us that the contrary is true, and we can very well understand it; the idiot does not coördinate, and without coördination there is no attention.

IV. THE ADAPTATION OF THOUGHT

Continuing the exposition of our scheme, we shall speak of adaptation. There is not only a direction in the movement of thought, there is also a progress; this progress manifests itself in the nature of the successive states through which one passes; they are not equivalent, the first is not of the same value as the

last. One arrives at the last state only because he has already passed the first state. This progress, seen as a whole and as it were from without, has often received the name of *choice*; thought, in order to evolve, makes a selection; it consists in constantly choosing between many states, many ideas, many means, which present themselves before it like routes which diverge from a crossroad. The figure seems to us sufficiently accurate. To think is constantly to choose in view of the end to be pursued; the formula is so true that it might be given a thousand different applications. But it has one fault, it is too brief; it states a result, the choice, that is to say, not a selection made with voluntary discernment, but the mere fact that the thought, placed before a host of possibilities, realizes but one. This is too brief, because we do not say in what the progress consists nor by what mechanism it manifests itself.

The explanation becomes at once better if we observe that the quality of the states of consciousness as they evolve is different and varies according to law. In fact the first states through which one passes are indefinite, the last states are definite; the first are undetermined, the last are more determined. Thought, one may say, tends to a determination; it even consists in a determination; it starts from chaos where everything is indefinite, to end in a realization which by its definite contours resembles the reality. This explanation is certainly better than that of choice.

It has sometimes been believed that this stage of beginning resembles a general idea, and that the progress of thought would be from the general to the particular. The truth is, that in all the observations where one has been able to see closely the true progress of thought, in reading for instance, or in the conception of a sentence, the idea at the beginning lacks individualization, and becomes individual only by further work. Thus for instance, say a word to a person, and try to grasp what that word suggests to him. There is in this case, a very vague first stage, then comes one more precise, with a better determined thought. At the beginning the idea is embryonic. To call it general seems to us to start from an altogether false conception. The general idea is an exact idea and not a vague one; it is an idea that includes numerous possibilities of individual application, and consequently it seems to us to be rather a multiplication of exactness, and a

sum of individualizations rather than any indetermination whatever.⁴

Let us go farther; thought is not only an exact determination. Its object is not a disinterested existence, and without bearing upon the necessities of life. Like nutrition and respiration, it is a vital function; it exists only because it is of use. It serves to adapt us better to the physical environment of nature, and to the moral environment of our fellows. Every idea, as has often been said, leads to action or contains a potential act. But the idea would be of no use if its determination were not exact; it must be exact in order that the means may adapt itself to the end, in order that the thought may adapt itself to the goal to be pursued. Every thought is like a key which must fit exactly in the hole of some lock.

These adaptations presuppose many realized conditions; first that the end to which one adapts oneself be posited, then that it be chosen, finally that it be attained.

Posited; we wish to say that it must be definitely stated so that one knows where one is going. Many cases are possible, because nothing is more varied in shade than the psychic life. Sometimes the end is as definite as a formula in algebra, and in fact, to solve a problem in algebra is to make an effort toward an end which is expressed by the very terms of the problem; the end is put in an equation. Sometimes the end remains vague; it is a general idea, an ideal of beauty, of goodness, of truth, of justice, that each one interprets in his own way and which sometimes is felt rather than expressed. As often happens, feeling, that sort of confused thought, takes the place of the clear idea.

The choice of the end is not less important nor less difficult. In every day life many different ends present themselves to us, and we are obliged to make a choice. The thought is higher in proportion as the choice is better. We have said in relation to attention—and it might be remarked in relation to will, reason, and even to feeling—there exists a hierarchy among possible acts of adaptation; there are insignificant acts, and others that are important; there are those whose advantage is small and immediate, others whose advantage is very great but remote.

⁴ See in *Experimental Study of the Intelligence*, p. 135, a passage where this point is studied.

To know how to choose is to subordinate the lower nature, to dominate the instincts, to elevate life. The mentality of the child, of the imbecile (and unfortunately also of many adults who for this reason can never improve themselves), consists in preferring the immediate pleasure of the moment, to the more lasting pleasure of the morrow, and consequently in developing an activity which does not calculate, does not reflect, and above all does not economize, and which therefore cannot accumulate capital.

But we shall not linger over these questions of choice of ends for they do not come within the domain of the present study. The choice of ends depends less upon the intelligence than upon the emotional, the affective, the instinctive life. To make a broad distinction, one might say, the end is chosen by our tendencies; but the means for attaining this end are combined by our intelligence; our study must confine itself to the adjustment of means to an end, which is the proper work of the intelligence, and which constitutes adaptation.

When it is a question of a new action, the adaptation does not take place immediately at the first attempt but by gropings, that is to say by successive trials; one is like a locksmith called to open a locked door; he searches in his bunch of keys and tries many but he does not try them all indiscriminately, for he sees at a glance those that will not fit; his attempts are not blind, they are directed, selected, according to a complex mechanism, which we have not the time to describe here.

All that is abstract in our description, disappears immediately when we recall in detail the observations which we made upon imbeciles. This appeal to experience will not only help to render our scheme more clear, but will enable us to understand why the defective remains stationary and does not continue his normal development.

Thus, first of all, we shall explain how it is that for certain operations an imbecile is equal to a normal person. We have seen that defectives perceive slight differences of sensations for weights or lengths almost as exactly as we do. This is because there is no necessity for reflection, and the thought does not need to evolve; it suffices to have consciousness of an elementary sensation of difference—the act of thought is, in itself, elementary, and if the state of consciousness has an extreme definiteness, it

owes that definiteness solely to the sensation sensed, not to the psychological operation of sensing. Moreover, we have already noted that a normal subject who should continue to examine and reflect would end by losing the fine sensation of a slight difference. This is indeed a proof that all development of thought, without going out to meet the result sought after, can be assured only by producing a good state of attention.

Another case. We have shown, that in forming associations with a word an imbecile succeeds as well as a normal. We ask him to say any word, associated with the word pronounced to him. This is an arbitrary procedure, a thought scarcely determined and really the operation required is suited to the mentality of a defective, and we can understand that he willingly submits. On the contrary the normal is uncomfortable, asks if he is to say just anything, and is surprised at the small significance of such an experiment; his discomfort is easily understood; habituated to adapting himself to an end in determining his thought, he finds himself lost when he has no means of knowing to what he must adapt himself, especially so when we allow him to suppose there is no end to which he must adapt himself. Put aside this particular mental state, and retain only the words said in association, and we see that those of defectives are very nearly of the same nature as those of normals and, moreover, paradoxical as it seems to anyone who attaches an absolute value to the quickness of thought, the defectives are more rapid, simply because they do not choose, do not direct their thought, but give the first word that comes to mind.

This is permissible in an experiment upon the association of ideas; but they comport themselves in the same way in other cases, where they should adapt themselves to a definite end. Let us cite some examples. In order to make an inventory of their knowledge we show them a piece of money or a playing card, and ask them what it is. We are surprised at the difficulty we meet with in determining exactly what they know, because a one-franc piece will be called first 2 francs, then in another minute 1 or 3 francs or 2 sous by the same subject; in the same way, when they are presented with a card, a nine of spades, they say spades, or clubs, or diamonds; and if one insists upon being told the number of points, they will say that it is 8 of spades, then say that it is 7, or 10, or 9, or 4. In the face of these errors and

contradictions, the inexperienced experimenter has a tendency to become impatient; he is inclined to reprove the imbecile, to chide him for his lack of attention, for it seems truly, that if he took a little pains he could reply correctly. This would be a grave error of method. The important thing is not to obtain from the imbecile a correct reply; this would be the act of the pedagogue and is here altogether out of place; the important thing is to determine with precision that peculiar mental state, thanks to which our defective is contented with the first reply which comes to mind.

It is not quite the first response that occurs to him, it is rather a lack of elaboration. The imbecile, of whom one asks the name of pieces of money spread before him on the table, does not reply with any random word; he does not say "It is a dog." He gives the name of a piece of money. In the same way, if we show him a square of red paper he does not name a piece of furniture, he names a color; he says—incorrectly—that it is white or blue. In other words he gives the genus for the species. It is therefore a first determination, very insufficient, but it satisfies him. He goes no farther; he does not go far enough to name the right color.

In the same way when he is shown a picture containing a great number of objects, and we say to him: Where is the —— suspending the voice at the moment of naming the object, it sometimes happens that the imbecile, too eager to satisfy us, puts his finger upon any object whatever. This is a form of suggestibility caused in part, as we have shown before, by an excess of deference and which results also from a facility for saying no matter what without reflection. Nearly all the cases of suggestibility which we have described among imbeciles reveal just this particular mental state.

To fix the ideas, we have designated this state by an arbitrary and truly clinical name: *n'importequisme* (no-matter-whatism). A thorough analysis would show that this *n'importequisme* is very complex; we suppose that it has for its essential condition, an absence of critical sense; the imbecile does not realize the insufficiency of his reply, and it is necessary that he should not realize it, otherwise he would not be satisfied with such a gross approximation. We shall return to this point in a moment, when we study that special element of thought—control. But

in our opinion the *n'importe*quism has need of two other conditions, a thought that does not evolve, and a thought that does not pullulate.

According to circumstances, one of these defects in the thought of the imbecile will manifest itself more than the other. The insufficiency of its pullulation shows especially in the "game of patience," which consists in joining the pieces of the cards in such a fashion as to reconstruct a whole. With this problem, a normal person who really wishes to take the pains to succeed, shows a remarkable abundance of ideas. One combination failing he tries a second, then a third and so on, either in maintaining a part of the previous combination which seems to him good, or in imagining an entirely new construction; there is a continual struggle between his memory and his imagination, and from this struggle, fertile combinations are born. His intelligence, encountering an obstacle, is like the water in a stream which, arrested by a stone, turns back and struggles against the obstacle. With the imbecile, the slowness of the production of ideas is very striking especially when one has watched the work of a normal. It is no longer living water that flows, but a streamlet of wax that congeals. Not only does the imbecile content himself with something nearly true, owing to the absence of critical sense, but moreover the number of attempts which he makes is extremely small, two or three for example, where a normal would make ten. Herein lies the explanation of the poverty of ideas which makes any conversation with an imbecile so insipid. Let us recall our friend Albert, who when warmly greeted after a week's absence, "Well, well my dear boy! It's been a long while since we've met! What have you done all this time? Tell us all about it," replies simply—"I have swept."

Under other circumstances one sees in the imbecile less the lack of pullulation than the lack of differentiation of the thought. We might cite very many examples to support this; we shall give only two sorts, which we have observed in the perception of pictures and in the definition of terms.

It will be recalled that many imbeciles can say only a single thing of the picture shown them, "There is a man, there is a woman." We have made the summary remark that it was through lack of *penetration*. The expression was superficial, the analysis was summary; seen more closely the phenomenon

reveals to us especially an arrest of intellectual development through lack of *differentiation*. In what does the interpretation of a picture really consist? It consists in completing the image by the appropriate evocation of an idea which adjusts itself exactly to the picture, so that this interpretation is fitting to this picture and fitting to it only. The operation consists in adjusting oneself to an end, and this end is furnished by the picture. We see in the replies of our imbeciles, that the adjustment is far from being definite, and that their commentary on the picture has nothing characteristic or individual. They say to us, for example, of a picture which represents a combat of horses, "There . . . there are men," and they repeat apropos of another picture representing men drinking at a table, "There . . . there are men." Identical replies for very different pictures. In other words their thought, instead of differentiating itself in a particular manner to adjust itself to each picture, remains vague, one might even say general, taking the qualification "general" in the sense of embryonic; in a word it does not evolve. It would fit any of the pictures shown them, and consequently it properly fits none. It is this absence of evolution which we have remarked about them, when they said, in naming 1 franc, that it was 1 sou or 10 francs; only with this difference; when our imbeciles name pieces of money or colors or playing cards they make an effort at precision; they do not say, "It is money, it is a color, it is a card," but rather, "It is 1 franc, it is blue, it is spades," and by the very fact that they are precise they fail. On the contrary their remarks upon pictures remain true because they are vague and insufficient.

The same remark holds with regard to the explanation which they furnish us or with the definitions which one can draw from them. To the question "what is a horse," "a table," "a chair," etc? they usually reply like a child of seven years, in terms of use. "A table is to eat; a horse is to eat; bread is to eat; a spoon is to eat." There is in this case, exactly as for the comments upon the picture, an insufficiency of determination, because all these formulas of use apply to all this group of objects only because they do not exactly adapt themselves to any one; such a definition is passable only because it is vague. It is the same phenomenon, which is produced through lack of differentiation in the thought. On occasion one can also distinguish in the

replies another interesting character, the utilitarian predilection, but this belongs to the domain of the feelings, instincts, and needs, and for the moment we are speaking only of the mechanism of thought.

To sum up: the effort of adaptation of which the imbecile mentality is capable is arrested in two different ways; first, through lack of successive attempts, which we have called lack of pullulation of the thought, which is equivalent to a weakness of intellectual activity; second, through lack of the work of differentiation which is necessary in order that the exact adaptation of the thought to the end be assured. Let us recall the comparison of the key. The imbecile can try only one or two keys to open the lock, and the keys are badly adjusted; the key grinds, and the lock often does not open.

A word in regard to this. One will think, perhaps, that the lack of intellectual activity and the lack of differentiation of the thought go together, and are the same fact seen under two different aspects. It will be supposed that every active thought must evolve, adapt itself, differentiate itself, and that consequently it is the weakness of the activity, which prevents the mental evolution of the imbecile. In our mind this is an error of interpretation. We do not believe that the causes of an intellectual arrest can be reduced to a unity. These causes are many and when one of them is suppressed the arrest may still continue to be produced. We have made one observation which seems instructive in this regard. It has impressed us very much. It is the case of an imbecile named Cabussel, of whom we have already spoken. Cabussel does not resemble his fellow imbeciles in all respects; he represents a type that is not common. Ordinarily an imbecile is slow and has but few ideas. It is difficult to talk with him, his replies are short, and he scarcely ever makes abundant remarks spontaneously. This is a particular mark of his weak intellectual activity; if he is made to find and to pronounce the greatest number of words possible in a give time, he finds very few; certain of our imbeciles cannot find 20 words in three minutes.

Cabussel, as we have seen, has a great deal of intellectual activity; his activity is shown by the vivacity and abundance of his conversation, which is such that we feel the need of a stenographer to take it down entirely; and yet his attention is not

better, nor his intellectual level higher than those imbeciles who, like Albert, have very much less activity. In particular, let us recall that Cabussel, notwithstanding all his vivacity of speech describes, in exactly the same terms as Albert, the pictures which are shown him. He limits himself to saying, "There, that is a man; there, that is a woman." This is certainly a proof that thought can pullulate without evolving and that the level of the intelligence is distinct from the activity of the intelligence.

V. THE CORRECTION

The last piece of mental mechanism which we shall attempt to describe is the apparatus of control. This has been designated under different names; *critical sense* is the most commonly known; *judgment* is the technical expression of psychologists; *auto-censure* is a happy word, recently proposed by certain alienists to name this faculty of control when it exercises itself upon itself. Perhaps this last point of view is the most interesting. In effect it is a question here, before everything else, of a faculty of control, which has for its object its own operations. When we judge, we take one after the other, two attitudes; one is turned towards the exterior world, which we perceive and evaluate; the other, the fact of reflection, is turned back upon ourselves, and it is ourselves that we evaluate.

It is evident that we all know this sort of auto-criticism and that all of us have exercised it upon ourselves. It is familiarly expressed in the dialogue of a naïve person talking with himself, when he counsels himself before acting, and scolds himself afterwards. It translates itself nobly in the monologues of the classic theater, where the personage finds himself divided between the demands of duty and the impulse of his instinct. In ordinary life, we pass continually from the rôle of actor to that of judge; we are never sufficiently seized with the fire of action or of feeling to lose the faculty of judging ourselves, or rather the two attitudes are not successive but they mingle in a composite whole; one is moved and at the same time is a conscious witness of one's emotion; and even the cold and sensible reflections made upon oneself do not detract from the sincerity of the feelings experienced.

The anecdotal side of this question presented itself to psychologists when they sought to learn what was true in the *Paradoxes*

of *Diderot*. Diderot claimed that an actor can play properly only when he feels nothing of what he expresses; because how could he be moved and at the same time regulate his steps upon the stage, and watch the effect of his play upon the audience? The reply has been made to this that although the emotional capacity of actors varies according to the temperament of each one of them, there is nothing paradoxical in admitting that they are at the same time moved and master of themselves; the essential of artistic emotion is that it be under the direction of the will and the surveillance of taste.⁵

In the preceding description of the scheme of thought, we have constantly taken for granted that the control is at work. Let us recall that thought consists in an adaptation. It is necessary that the means not only be found, but be judged capable of attaining this end. Before pulling the trigger the marksman sees that his weapon is properly aimed. In the same way the control intervenes to make sure that the means are efficacious; those that are judged good are adopted; the others are rejected. Without this attentive selection no adaptation can succeed.

What is most curious is that the effect of the control makes itself felt, while for the most part the control itself is unconscious. When we undertake a commercial affair we know what is possible for us to attempt, what is possible to demand, and this feeling is sufficient to stifle a host of unreasonable ideas, even before they appear. We do not have to disperse them and sort out the good grain, for usually the greater part of the bad grain does not present itself. There is here a silent work of systematization which is extremely useful.

Let us pass on to our defectives. At every step of our observations we have discovered their lack of this power of control. A certain one, in our presence, yawns, or scratches himself in the most comical manner; this is a lack of control through lack of good manners. Another told to copy an "a" scribbles a formless mass at which he smiles in a satisfied manner; this is lack of control through lack of attention, because these same imbeciles, if one insists, can be made to see that their scribbling does not resemble the model. But it is especially when we ask their opinion upon some question which they do not know, that we

⁵ See A. Binet, *Le Paradoxe de Diderot*, *Année Psychologique*, vol. iii, p. 279.

discover their lack of control. This state of *n'importequism* already pointed out is composed in the first place of a lack of evolution and of differentiation in the thought, and in the next place by an absence of criticism. We have already remarked that to reply, "It is exactly eleven o'clock," when one cannot tell time, to give the first color that comes into one's head when asked to name a particular color, must mean that the sense of demonstration is lacking, the sense of the absurd, the fear of being wrong, in a word all of those states which tend to correct and reduce and which constitute control.

But it is necessary to remark, that in order to bring out this *n'importequism* clearly, it is necessary to exercise force upon the intelligence of imbeciles. Left to themselves, they do not say and they do not perform all the absurdities that we draw from them; if they have committed very many blunders in their conversations with us we are somewhat responsible, because we obliged them to reply to questions beyond their reach. In short if they are lacking in judgment they are equally lacking in direction, in adaptation and the rest; if their functionings are in a rudimentary state, there is at least some harmony in all these rudiments. It would therefore be wrong to think of comparing them with those degenerates, among whom impulsive acts betray a lack of harmony, a loss of equilibrium. These are mental conditions of a very different nature.

VI. ORIGIN OF THE SCHEME OF THOUGHT

The scheme of thought which we have just set forth has been made definite by our study of defectives and by our need to explain wherein their deficiency consists; but its origin dates farther back. One of us had already this idea in mind when he wrote some ten years ago, his "*Experimental Study of the Intelligence*,"⁶ which we have often been obliged to cite; the observations contained in that book have stimulated experimentation in Germany upon the psychology of thought, which is at the present moment being carried on with much activity, and which passes by the general name of the *Method of Wurtzburg*.⁷

⁶ Schleicher Brothers, Paris, 1900.

⁷ This name is used because the psychologists of the University of Wurtzburg have been the second to employ this method. This is a curious usage with which we are unacquainted. Or rather, it is the second

It will also be noted that the expressions of *direction* of thought, of *correction*, and other equivalents are currently employed today by many authors, and our scheme itself, although it is perhaps more definite and more complete than anything which has been proposed, will seem to many to lack originality.

It is important to point out in conclusion exactly in what respects our scheme seems to us to be in advance of the former theories of the mechanism of thought, and what characteristic points it presents.

In the first place one might believe a double use was made of the primordial faculties of mind, which have been described from all eternity under the familiar names of memory, attention, imagination, judgment. We have sometimes employed these expressions in our descriptions, but we have not abused them, and it would have been easy for us not to have used them at all. Would it have been possible to reduce the scheme of thought to a play of these faculties? At first thought this reduction merits a trial, because it seems very seductive.

One might remark that all that we have described under the term *direction* is only attention; our auto-correction is only judgment; and as to the act of adaptation, which is the center of the system, one could just as well reduce it to memory, which conserves the states of consciousness, and to the imagination, which raises them up at the proper moment.

But on reflection it seems to us that to reduce the scheme of thought to these known faculties would be to take from the scheme all its originality. On the one hand the essential point of the new theory is considering thought as an action, the action consisting in adapting itself; it is around this conception that everything gravitates; furthermore, the principle of adaptation is not contained in any one of our intellectual faculties; there is in it an idea which surpasses them. On the other hand, if the principal parts of the system, *direction*, *correction*, *adjustment*, can be explained by a play of the attention, memory, imagination, judgment, it must be noted that any one of those faculties taken alone would be ineffectual for the work that one would

example of which we have any record. The first is the following: the study of errors in testimony which we inaugurated is currently designated today by the name of the author who took it up after us, and bears the name of the method of Stern.

wish to assign to it. Take for instance auto-correction. Is that judgment? Yes, without doubt; one must judge in order to correct oneself, but correction supposes more than an intellectual appreciation. It supposes in addition, an arrest, a suspension of a defective motor tendency; to judgment one must add will. Sometimes correction is made in full consciousness after an effort of reflection; in this case attention must be added to judgment and will. Nor is this all. The arrest may be made without making an intellectual judgment, by the conflict of an emotional state which serves as antagonist; one must then add to the list of acting faculties, a new faculty, that of emotivity. The list is already long, and we have taken into account neither memory, which is necessary in order for us to possess the motives for rendering a judgment, nor imagination which serves to present them forcibly to the mind.

Let us take another example, the direction. Is that attention? Without doubt, and we do not deny it; but it will be easy in analyzing this second case, to show all that this faculty implies; an observation taken from life will prove it to us. An imbecile Denise who is listening to us suddenly changes her *direction*; while we talk she is attracted by a bird flying in the garden, and she begins watching the bird and forgets us. We say that the first direction has been abandoned, and that is sufficient for our scheme. But what is the mechanism of this derailment? Is it lack of attention? Is it lack of memory? It is extremely difficult to know, because direction supposes, among other things, memory and attention, and the difference between derailment through lack of attention, and derailment through lack of memory is extremely subtle. We would say lack of memory when the directing idea has completely disappeared; lack of attention when the idea, without completely disappearing, has lost its interest and is disregarded. All these distinctions are of but little importance. Here then is a case which shows admirably not only that the greater part of our primordial faculties is involved in each part of the scheme of thought, but moreover that it may be a very delicate matter to establish the rôle of each one of these faculties.

In short then, we may conclude that the theory of the intellectual faculties and the theory of the scheme of thought belong to two different planes.

To make this distinction more clear, we borrow from biology the following comparison; the primordial biological element is the cell; in grouping themselves, cells form the tissues; tissues in their turn form the organs. In the same way one might say that the intellectual functions of memory, attention, judgment, etc., correspond to the cells; combining themselves, they form something analogous to a tissue. What corresponds to the organ is our scheme of thought, because, like the organ, this scheme has a function.

It is perhaps in this last word, function, that the chief originality of our new scheme of thought resides; and if this word is understood in its fullest sense, one sees new perspectives opening out. One will understand that there is a certain amount of the obsolete in contemporaneous psychology, and that one must encourage a different psychology, the one which is already called in America functional psychology.

In our opinion it will henceforth seem superannuated to make psychology a science of introspection, or to express it better, of contemplation, which has for its object of study the states of consciousness, and which has no other end but to describe all the qualities of these states. In fact, up to this point, we have seen in the faculties of memory, attention, judgment, imagination, only those faculties which spend themselves entirely in states of consciousness and which serve either to conserve these states or to reproduce them, or to amplify them, or to compare them, or to decompose them. One never gets beyond them; they are considered not as means but as ends. Consequently it has been believed that in every act of thought, the emphasis must be placed upon the states of consciousness, even upon the imaginative representation, so that it has caused great surprise to learn that there can be thoughts without images, without words, and reduced to a feeling. Consequently again, it has been believed that the explanation of the mental operations could be seen in the properties of images; the English School has wished to explain the reason of all mental phenomena without exception by the mechanism of the association of ideas, and recently a well-known author sought to explain attention by a state of mono-ideism.

To this conception of a structural psychology we oppose its counterpart, that which gives action as the end of thought and

which seeks the very essence of thought in a system of actions. All the consequences of this new orientation, at least if it succeeds in making itself accepted, will develop with time. There are intimate consequences that will make themselves felt in the manner of positing the most serious psychological problems, in particular the manner of understanding the attention, generalization, and also the relation of the conscious to the unconscious, and the reciprocal influence of the emotions and the thoughts, and finally the relation of delirium to emotivity. We already have here the principal points upon which it seems to us great changes will take place. We note, as a logical example of the revolution which we predict, a new method for measuring the phenomena of consciousness; instead of measuring the *intensity* of these phenomena, which has been the vain and foolish ambition of the psycho-physicists, we shall measure the useful effects of the acts of adaptation, and the value of the difficulties conquered by them; there is here a measure which is not arithmetical, but which permits a lineal seriation, a hierarchy of the acts and of different individuals judged according to their powers.

Questions of detail aside, if we seek to take into account the evolution of the whole, which we approve, we can assert that psychology, having become a science of action, takes on an altogether different attitude for pedagogy, for morals, and for scientific philosophy.

For pedagogy it ceases to be the lonely exercise of hermits, a delight of the sophists, an application of "Know thyself" which has caused it to be said up to the present that this analytical science has no educative value. In obliging us to come out of our own inner consciousness, in order to understand our fellow-man in the life of action, it takes on an aspect of social science. In morals the consideration of ends permits it to receive inspiration from whatever there is that is useful and solid in the doctrines of pragmatism in vogue. There again we encounter an interesting point of contact with the contemporaneous tendencies which are still vague, but very powerful. But it is especially by the manner of positing the great philosophical problem that the revolution will make itself felt, for while the psychologist of contemplation tends to detach himself from the exterior world and to seek only the differences between his states of consciousness and his own body, which produces a gulf between the physi-

cal and the moral world; the psychologist of action, who sees that the physical and the moral concur in every act of adaptation, will apply himself rather to demonstrate their union, and instead of an antithesis, will tend to make a synthesis.

ALFRED BINET AND TH. SIMON.



Il ne s'agit que d'expérimenter et d'observer,
cela est vrai, mais que de peine à trouver
la vraie formule de l'expérience.

A Binet

PART II

The Language of the Feeble-Minded

I. A NEW PSYCHOGENETIC METHOD

We desire to draw the attention of our readers to a study which, in our opinion, constitutes a new psychological method; this method consists in analysing the manifestations of intellectual phenomena among certain individuals designated by the names idiot, imbecile, and moron. Imbeciles perhaps form the most instructive group of all these defectives and it is of these only that we shall speak in our short article. We believe the method which we present is new and we hope that we shall be able to demonstrate its novelty. Our affirmation may be doubted by those who know of the enormous literature which exists upon all defectives; but the clinicians who have devoted themselves to these patients and who have even made for them a vague pedagogy adorned with the pompous title of *the medico-pedagogical method* have never, so to speak, examined them from the point of view of the problems which their mental state raises in regard to modern psychology. In fact the chapter upon "Backwards" is the most backward of all psychiatry.¹

The method which we are going to describe is a *psychogenetic method*; let us characterize it first by indicating what branches of study it resembles and from what other branches it is differentiated.

For the past thirty years the field of psychology has been so furrowed in every direction that it has become extremely difficult to present a general view of the investigations which is coherent. There exists at the present time an *objective* psychology which is often opposed to a *subjective* psychology, terms vague and almost indefinable. In the same way *experimental* psychology has been opposed to *pathological* psychology, the authors failing to recognize by this distinction that the observation of these patients is

¹ We hope that this appreciation will not be considered an unjust criticism upon certain good works that have appeared upon the psychology of imbeciles. The work of Dr. Sollier is well known, and for the epoch in which he wrote, is excellent. But psychological analysis has progressed greatly since that time and we are under the necessity of studying very many questions of which no one had then dreamed.

compatible with experimentations quite as complicated as for normal subjects and laboratory students. In this pathological branch are grouped together *psychiatry* and *hypnotism* although, both in regard to their value and their processes, they are entirely different. As for experimental psychology it is almost universally confounded with psycho-physics of which it is nevertheless only a very insignificant part; and this confusion is all the more regrettable because it permits those who condemn the barrenness of the psycho-physical to anathematize at the same time the whole psychology of experimentation which is supremely unjust. And moreover there is again *physiological* psychology whose domain is so badly defined that it is confused with normal psychology, with psycho-physics, and even with pathological psychology. This is chaos; and if the experts cannot always find themselves how can we suppose that the uninitiated can arrive at a clear idea of the whole?

We are not attempting here to put an end to this chaos; that would take too long. In order to indicate the ground we intend to cover, it will suffice to divide all psychology into three fields according to the *nature* of the phenomena involved, and not according to the *processes of investigation* which are common to the three fields. The first group represents the phenomena which have attained their full development, a static condition; this is the study of the adult normal. The second group represents the phenomena which are in a stage of total or partial dissolution, or of derangement, in a word, which correspond in the main to the somewhat vague concept of pathological phenomena. The third group, the only one with which this article is concerned, represents the phenomena in a stage of evolution; into this group enters first of all and above all the study of the child who represents the most typical form of evolution; then, with various differences, we can compare the child with the individual belonging to a lower civilization who has long been called by the naïve word *savage*; then we can compare him with the animal, and lastly with the defective.

To be brief, we shall retain of this enumeration only the two extreme terms, the child and the defective. It has long been said that the defective is comparable to a child arrested in his development. We have in our asylums imbeciles of forty who are at the intellectual level of a normal child of five years. But it must be

well understood that this resemblance is only roughly true. An imbecile of forty does not exactly resemble a normal child of five years; following the happy comparison of Kraepelin, he resembles him somewhat as would a caricature; he resembles him as much as an invalid can resemble a healthy person, as much as an awkward and uncouth being can resemble one who is all charm and grace. For the moment we shall not insist upon all the differences which obviously are numerous and which are moreover imperfectly known; of these differences the following interests us more than the others because it justifies the psychogenetic method for defectives. The normal child of five years is continually developing; he does not remain, so to speak, a single instant at the same intellectual level; he is following an ascending curve. On the contrary, the adult imbecile of forty has terminated his development; he will be tomorrow or two years hence the same that he is today, that he was yesterday, that he was two years ago, or perhaps even that he was ten years ago. He does not follow an ascending curve; he treads a level platform, and consequently one can discern the qualities and resources of his intellectual level, better than as though it were the question of a child; one can learn, for instance, all the acquisitions which his intellectual level can command; one can learn if his degree of intelligence renders him capable of learning to read, to count, to acquire this or that practical knowledge; on the contrary, one remains ignorant of these things for a child of five, because such child has not yet had time to learn them, and by the time he has learned them he is no longer five years old but has mounted to a higher intellectual level. Here then, as we take it, is the great advantage of the psychogenetic method applied to imbeciles; it permits us to know by an experiment as prolonged as we desire to make it, all the resources of an intelligence, all its capacities, all its potentialities.

II. APHASIA AND THE PSYCHOLOGY OF LANGUAGE

Let us leave generalities, and demonstrate by a precise example what we have just advanced. Psychology in its entirety could be viewed by this method but we cite only one particular phase, that of the development of language.

✓ The study of language will be very useful for our demonstration because it will furnish us with the opportunity of comparing the results obtained by three different methods, first, the pathological method, brilliant and well known, which has given us the aphasias; second, the psychogenetic method, known but little used, which consists in studying the child; and, finally, third, another psychogenetic method almost unknown and never practiced which consists in studying the imbecile. We shall also by a precise comparison observe the advantages of these different methods as well as their disadvantages. It must be well understood that we do not in any way attempt to establish a preëminence of one of these methods over the others. This would be neither correct nor kind. All the methods are useful; we are not in favor of exclusion but of synthesis; it is what we have always desired and always counseled.

Let us first ask, what have we learned from the imposing array of the manifold works on aphasia that is of general application to the problem of the mechanism of language? Let us pass over the infinite number of details, certain ones of which have been very suggestive, and let us restrict ourselves to a general view.

The study of aphasia has shown us in particular that what we call language does not represent a faculty unique, indivisible, moulded in a single piece, but is composed of a certain number of operations which are independent of each other, and that each may be destroyed or conserved to the exclusion of the others. This is the most important information that comes out clearly from all the observations which have been made upon aphasic cases as well as from all the diverse and often artificial theories which have been devised to express the difficulties of language.

✓ We recall merely that according to the simplest and most schematic

of these theories, language results from the four following operations: first, understanding; second, speaking; third, reading; fourth, writing, and that each of these operations may be suppressed separately by a cerebral accident. It has been disputed that this independence is equally complete for all but this matter of degree is of little import; what has been definitely proved is that there is *some* independence. Let us remark however that this functional independence can be realized only by an individual who is already in possession of the different mechanisms of language. It is the perfected mechanism which can act alone without the aid of the whole; it is necessary, for instance, that an individual should have previously heard language in order to continue speaking even when he has ceased to understand what he hears (word deafness).² The study of aphasia therefore, with many reservations which we pass over, shows the absence of relation between the established functions. It does not show what relations are produced between the functions which are on the way to being established. There is here a place for another entirely different study. Every one knows or supposes that if the faculty of speech becomes independent of the faculty of understanding it is not so in the beginning at the time of its formation, and that the child born deaf remains necessarily a mute. How could he pronounce words that he had never heard or had not been taught by another means? Therefore at the moment of this elaboration of the functions, numerous relations exist between the budding functions and the study of this part of the phenomena may be termed the psychogenesis of language. Aphasia does not comprise a psychogenesis, this must not be forgotten.

Correct
The psychogenesis of language can be investigated by different methods, by means of studies on children, or on primitive peoples. We are going to show how the study of imbeciles, who up to a certain point constitute permanent children, can be turned to account.

² We omit in the text an affirmation which might be criticised because, according to Dejerine and other authors, spontaneous speech is profoundly altered in word deafness; the patient having lost verbal auditory perception no longer understands his own speech and continually uses one word for another and misforms words. Other authors, as Marie and his school, do not, however, accept this as an explanation of the confusion observed.

III. AN OBSERVATION OF AN IMBECILE. SCIENTIFIC DETERMINATION OF HER LEVEL

As this article is only a short demonstration we shall limit ourselves to observing one subject in particular; this subject which we take from among many others is an imbecile of the lowest grade. According to the definition which we have proposed, we must place in the category of idiots all defectives who are incapable of communicating with their fellows by speech. Our patient is not properly speaking an idiot; she is located upon the threshold between idiocy and imbecility because she is able to make herself understood by speech although to a very limited degree. By choosing this patient we are permitted to study the psychogenesis of language, the formation of the first word, *the psychological conditions which are essential for the beginning of speech*, and this is precisely the end that we have in view.

Our patient Denise is a woman of twenty-five years, who belongs to a family of *petits ouvriers*. We suppress all purely medical details which would have no interest for our psychological analysis. Listen first to what the mother of Denise tells us regarding her poor child. There was no possibility of having illusions upon the mental state of the young girl. She was subjected to a medico-pedagogical treatment for eight years. What has she learned? Absolutely nothing her mother says; and of late she has even been deteriorating. (We give this opinion without taking any responsibility to ourselves.) The parents kept her for a long time at home. They considered her a child without intelligence but harmless. During her first years she took the breast normally and presented nothing exceptional. But she did not play or jump the rope as ordinary children do, although it amused her very much to watch the others play. The mother says with an excessive optimism that she understands everything; in reality she continually needs the help of those about her to perform the simplest acts. Awkward to the point of being unable to make a bow, she can nearly dress herself but must be watched to see that she does not put her clothes on wrong side

out. She does not know how to comb her hair or wash her face; to do up her hair she turns it to one side and puts pins in it; she washes her hands mechanically without noticing the result. She eats alone decently enough, and can help herself to drink; her meat and bread must be cut; she is rather difficult to please in regard to her food, and would like to drink wine or cognac. It is only recently that she learned to open a door. She even learned to thread a No. 8 needle. She cannot be taught to do anything useful; in sewing she remains hours making the same stitch and the stitch once made she pulls it out. Or else she busies herself cutting rags or paper. If she sweeps she stops because she is without sequence in her ideas and leaves the dirt in the middle of the room. She cannot be made useful in preparing vegetables. She shells peas by biting them. She cannot, unaided, do any useful work; someone must always be near to watch her. One cannot even tell her to gather the flowers; she will pluck anything. At such a level the imbecile is therefore practically useless.

Her disposition is sweet although a little restless; she is not contented anywhere; if she is in the house she always wishes to go outside. What pleases her most is music, singing, and especially moving pictures. We are assured that she has a true voice in singing. She is affectionate, she loves everyone, but is spiteful, remembers an affront and does not wish to see the person again who offered it. She is timid, is afraid of fire and carriages. She is at times subject to violent fits of temper during which she beats her head with her fist or strikes it against the wall. She has even a little jealousy. Against whom? Against her mother's cat! This last trait completes the portrait of the poor innocent.

It remains to be seen for what reason she was placed in the asylum. The parents noticed that of late she had had convulsions with blood in her mouth, jerking of the limbs and eyes turned back. Following these attacks she slept and snored loudly. At other times she simply lost consciousness after which she asked to urinate; in coming to herself her eyes were fixed and saliva was on her lips; a bonbon was put into her mouth. The parents were alarmed at these attacks which certainly had the characteristics of coma; they reproached themselves, the poor souls, for having kept their child at home. "You see," the mother said to the father, "it's all your fault; she ought to have been cared

for at the hospital." As a result of all these fears they decided to place their child in the asylum. Let us add that these attacks are very infrequent with her. During the several months that we have been studying her they have only manifested themselves once.

Let us examine the patient. Short in stature (4 ft. 8 in.) somewhat stout, heavy, the waist thick; there is nothing abnormal about her physical appearance. The head is well formed but small like that of a child of ten years. The features are regular and well cut; there are no wrinkles; the face is fat, the cheeks pendant; there is in the whole body a general tendency to overweight. The subject is twenty-five but appears thirty. The countenance is wide awake and mobile; small black eyes, brilliant and lively, expression almost mischievous. The moment she enters our office we hold out our hand; she shakes it and begins to laugh showing her white teeth. It is not simply a laugh but a foolish uncontrolled laugh. We studied her during many sittings, because she was at our disposition whenever we wished, without interruption. At the least noise, the slightest gesture, at anything or nothing she bursts into loud laughter. She is a real child. During our many interviews, at every outside noise such as the ringing of a bell, the opening of a door, etc., she suddenly placed both hands on her abdomen. This was a play rather than a tic.

This is not the only proof of her childishness; she is affected with echolalia and mimicry accompanied by all kinds of comical actions. If one coughs she coughs; if one blows his nose, she blows hers; if one laughs, she laughs. She repeats the last word of a sentence which is said or else says yes in acquiescence, even when one is paying no attention to her. At the same time she imitates whatever one does. If one writes, she takes on a mischievous air and pretends to write with her finger on the table; if one scratches himself she scratches herself; if one crosses his arms she does the same; if one twirls his moustache she imitates the action. The imitation by gesture or voice is done quickly, accompanied with a laugh and mocking air but the imitation does not continue long. Very quickly her attention fails; Denise thinks of other things, looks about her, then after a time comes back to us and if we continue to write she resumes her imitative gestures. When she is not thinking of us her face suddenly becomes serious and nothing is more comical than the rapidity with which this poor

creature passes from seriousness to laughter. This tendency to laughter, to echolalia and mimicry manifests itself most strikingly when she is in a familiar environment. It is all done with the mischievous air of a school boy who makes fun of his master.

Before a witness whom she does not know Denise is intimidated, remains shy, and shows no evidence of echolalia or mimicry. It is therefore something different from reflex echolalia, since it is under the influence of psychic causes and is exercised only under certain easily determined conditions. Neither is it a voluntary echolalia, the art of imitation as practised by a comedian who gives himself to this effort as others give themselves to any sort of work. It is an intermediate form which is at the same time partly reflex and partly voluntary and which very clearly expresses the childish character of Denise.

Furthermore all her gestures reveal her mental level. Sitting by our side she picks her nose or scratches her head without sufficient reserve; from time to time she yawns noisily or sighs; at times she says "Mama" in a plaintive tone or carries her hand to her face; she has at such times a flushing of the face and she breathes heavily like someone who is very warm. Let us also add that she is very gentle, not at all stubborn and one can do with her whatever he will. This group of facts constitutes an attitude that is very peculiar, childish, gay, mocking and altogether feeble-minded.

The facts here recorded show us that Denise has the character of a child; but she is not only backward as to character but also backward in intelligence; one can very well suspect this from all that we have said of her. Thus socially she is useless since she has neither enough application nor enough discernment to perform the most humble task. One could not even employ her to sweep because even for that she would need watching. But all these little facts give only one impression. One must go farther and fix the position of this imbecile in the scale of intelligence.

Without wishing to treat fundamentally a question which here presents itself only incidentally, let us recall the grades between which one might hesitate in classifying our imbecile; these grades are first, idiocy of the highest degree; second, imbecility of the lowest degree; third, imbecility of the intermediate degree.

The table which we here give indicates briefly the mental capacities of these three degrees.

High Grade Idiot.....	{ Capable of understanding a gesture and of executing simple orders given by gesture, like coming, seating themselves, getting up; capable of imitating a gesture or an attitude when ordered, for instance, clapping the hands, dancing, crying, etc.
Lowest Grade Imbecile.....	{ Capable of understanding and executing simple orders given verbally without gesture, for instance, "Get up! Where is your eye? Go bring me the bouquet which is on the table! Where is the ink-well? Show me a pencil! Where is the little girl in this picture?"
Middle Grade Imbecile.....	{ Capable of naming common objects when pointed out, of comparing two lines or two weights; and of copying a square.
High Grade Imbecile.....	{ Capable of repeating three figures; of performing the three errands; of naming exactly certain pieces of money; naming the colors; counting 10 pins; knowing the names of the days of the week and the months of the year, and the number of fingers.

Denise can pass all the tests of the high grade idiot; they are of course very easy and with the exception of the last do not surpass the intelligence of a dog.³

She passes the tests of low grade imbecility very well. Upon verbal command she rises, seats herself, dances, cries out. She points out objects named to her. She also designates in a picture the object she is asked to find, a child, a window, a little cat, etc. by immediately putting her finger on it saying, "Aya!" with a childish expression of satisfaction. Moreover she is so suggestible that if one tells her to find an object which does not exist in the picture she points to anything. One might even believe that she always went at random, but an attentive study of her gestures shows that she understands very well what is named to her.

³ We must use a certain reserve in comparisons which one is tempted to draw between a human being and an animal in respect to their intelligence. The difference of the organs, larynx and anterior members, prevent an animal from performing acts of speech and of imitation without the level of his intelligence being necessarily the cause.

Denise fails in the tests for middle grade imbecility. She can scarcely name one of the objects presented to her. To the question, "What is this?" she replies, "Yes" and bursts into laughter. She cannot copy a square, or compare two lines or two weights. When one gives her the two weights to compare and asks her which is the heavier she puts a finger upon each and replies, "That," with great satisfaction. She designates a line at random with complete inattention and from time to time she gives a great sigh as though complaining of the over strain demanded of her intelligence. She is therefore an imbecile of the lowest grade; her intellectual inferiority manifests itself in the tests that do not require speech, an important point.

Another example of her intellectual inferiority, she cannot execute three orders at a time. She does one; if we ask her to get a flower which is on the table near at hand she quickly executes this simple order; but if we add two other orders, for instance, to strike three times on the door and change the position of a chair, she cannot execute successively these three orders; she can recall but one of them, most often the last, and after having executed that she returns completely satisfied and takes her seat.

All this permits us to conclude that Denise is a low grade imbecile. It can be seen that this conclusion is not simply a formula, it implies and sums up a series of numerous tests and of verifications.

IV. ANALYSIS OF THE STATE OF LANGUAGE OF THIS IMBECILE

The intellectual level of Denise is so low as to have some influence upon the development of her language. When one encounters a subject so lacking in intelligence, one expects that he will speak very imperfectly. We shall study successively in Denise the three following points:

1. The vocabulary in spontaneous speech.
2. Articulation.
3. Comprehension of spoken words.

1. *Vocabulary.* To say that Denise does not speak would be an exaggeration; it is not complete mutism; she pronounces merely a few short, simple words which are almost all substantives, such as *yes, no, papa, mama, pipi, aya*, (for *voilà*) *good-day*, and *good-bye*. The mother, indulgent and blind like all mothers, assures us that the vocabulary of Denise is composed of some forty words although she admits that she could never recognize nor pronounce the names of her brother or her sister. This evaluation of forty words seems to us exaggerated. There is still another word which Denise loves and which she often pronounces, it is *zut*. Several of these words really serve her the purpose of language; we mean by that she never uses them at random to amuse herself by the sound or as an exercise of the larynx, as children often do, or by false application to objects. Every time she uses them she gives them their exact meaning. Thus it has often happened that feeling a need she turned to us, no longer laughing, took on a most serious air and said, "Pipi." At another time seeing her completely occupied during our questioning in turning and looking at a cheap ring which she had on her finger we asked her, "Who gave you that ring?" She replied immediately and without the slightest hesitation, "Mama." This is indeed language. It has been seen that it is reduced to a very small number of common and proper nouns. Let us add that she rarely uses even the words that she knows, so that she seems mute. She might therefore be compared to a child of one or two years who has

commenced to speak but whose vocabulary is still very restricted. But there is a difference. The normal child is constantly making an effort to increase his little vocabulary; while still very young he subjects his larynx to exercises to produce suppleness and emits all sorts of varied sounds. This babble is foreign to Denise. She does not try to increase her verbal acquisition, an important difference such as is always found when one attempts to compare the defective with a normal child.

In order not to forget it one might express this difference in the following terms. In the psychology of an individual there are two orders of phenomena, those which are acquired, representing the results of a former development, and those which require the realization of an effort, an expenditure which must be made at the very moment; we refer the first phenomena to the psychology of conservation because they represent a structure already formed; the second group of phenomena should be referred rather to the psychology of acquisition. Thus to name an object whose name is already known is the psychology of conservation; to learn and retain the name of a known object belongs to the psychology of acquisition. One can already see that these two psychological processes are subject to different laws; among demented the conservation is always superior to the acquisition; the demented knows things which at that actual hour he would be unable to learn if he did not already know them; he constantly shows a contrast between his previous acquisitions and his actual capacities. We recall a general paralytic very much reduced who allowed himself to fall several times from the chair where he sat, by inadvertently leaning too much to one side while travelling off the edge of a bandage which he had about his hand. Yet this same paralytic was still capable of reading. Among defectives the psychology of acquisition and the psychology of conservation are equal; the defectives have neither gone back nor progressed; they are today what they were yesterday; and they can acquire knowledge on a par with that which they already possess. Lastly, among normal children the formula changes once more. The function is superior to the organ; the power of acquisition surpasses that of conservation because children progress unceasingly, they become constantly better, they are superior today to what they were yesterday; the future belongs to them.

2. *Articulation.* Another point of resemblance between Denise

and a young child is that she has difficulties of speech which very much resemble the natural dyslalia of a little child. Little children pass normally through a period of imitation when they do their best to reproduce the sounds they have heard or that they themselves have invented in pronouncing at random. Their efforts at reproduction are complicated by awkwardness or errors; often a child is incapable of pronouncing certain consonants for months and even for years; he either suppresses them or replaces them by others; some authors call this difficulty of articulation *lisping* while others prefer to designate it by the name of *natural dyslalia*. It is essential to come to an understanding about the nature of these difficulties of speech. They must not be confounded with *mechanical dyslalia* which results from a malformation of the organs of articulation, nor with the dyslalia accompanying a nervous temperament; to distinguish these latter is important and the error which one would commit in confounding them would be as great as if one confounded the awkwardness of a gesture with paralysis, the contraction or the convulsion of a member.

We ask Denise to repeat the short words or letters or figures which we pronounce before her; she understands what we wish and lends herself as best she can to the attempt; one can almost recognize the word she pronounces but it is much distorted.

Here are some examples.

WORDS PRONOUNCED BY US	WORDS REPEATED BY DENISE	WORDS PRONOUNCED BY US	WORDS REPEATED BY DENISE
pa	ba	gâteau	toto
papa	papa	monsieur	tesui (?)
bobo	bopo	madame	dada
pif	pitui	caca	pipi
ga	ba	bébé	bébé

These imitations are rendered difficult by the bursts of laughter and also by that very particular mental state which we call *n'importequisme* (no-matter-what-ism) which consists in being satisfied with the first approximation that comes to mind. We cannot guarantee that the words which we attribute to Denise have been articulated by her in exactly the manner that we have written them; the pronunciation is so defective that sometimes

one does not know exactly what one hears. We have done the same for the letters of the alphabet:

WHAT WE SAID	WHAT WAS REPEATED	SAID	REPEATED	SAID	REPEATED	SAID	REPEATED
a	a	d	d	l	é	s	é
é	é	f	é	m	é	t	d
i	i, u, ui	g	dé	n	é	u	vu
o	o?	h	a	o	veu	v	jé
u	u	i	rrr	p	d	w	dédéwé
b	gé	j	j	q	vu	y	iducce
c	gé	k	a.é	r	r	s	éd

Conformable to what we have observed with children the vowels are better pronounced than the consonants. Nearly all the vowels are well pronounced as are also several consonants, especially the *d* and the *g*. But we have not thought it worth while to make a careful study of this difficulty of speech in order to find what part belongs to the organs of speech, to defective audition, or especially to the mental state of the subject. This extremely difficult study, very much more difficult than instructive, would take us too far from our program. The essential point is that the dyslalia of Denise is not the direct and only cause which prevents her from speaking. She might be able to talk even while articulating badly; she does not seem to realize that she misforms the sounds which she is asked to repeat and moreover, we are persuaded that she has not the mental state of those stammerers who remain silent because they are afraid to show their difficulties of speech.

M. Marius Dupont, professor at the National Institute for deaf-mutes at Paris, communicated to us recently the very curious observation⁴ of a little blind child of five years, who pronounces only vowels; when he wishes to say, "*Merci, maman chérie*," which is his favorite sentence, he pronounces the following series of sounds: *e, i, a, a, e, i*, which his nurse understands very well. Here is indeed a typical case of *alalia*. It seems to us important to remark that Denise has by no means so deep-seated a trouble of pronunciation and, consequently, if she limits her language to pronouncing only eight or ten words the cause of

⁴ This observation appeared in the *Bulletin de la Société de l'enfant*, 1907.

her lack of development of speech must belong to another order than that of difficulty of articulation.

Verbal perception. As an interesting contrast this subject understands speech. She is almost a mute but she does not have word deafness and her comprehension of speech is sufficient to lend itself to different complicated tests. Here in fact are orders given her which she executed without the accompaniment of any gesture which would enlighten her upon the sense of the words:

Clap your hands! She claps her hands.

Dance! She makes contortions with her arms.

Run! She runs a little in the room.

Sing! She does not sing, probably does not dare before us, but after hesitation yawns noisily. We suppose that for her this amounts to the same thing.

Go and open the door! She goes to the door and taps it with her hand.

Go and get me a book from the table! She executes the order.

Read! She makes the gesture of holding a book under her eyes.

Where is your eye, your nose, your ear, your hand? Designates exactly each time.

Where is my watch? Indicates my watch which is on the table.

Where is the floor? Raises her arm and indicates the ceiling.

The key of the lock? Says "There" and points to the hole in the lock.

The pins? Points to the pins that are on the table.

The basin? Points to a basin that is on a nearby table.

The placard? Points at random to the wall.

The table cover? Points to the cloth on the table.

The penholder? First points in the air then designates the cloth on the table.

The eye glass? Points in the air and raises herself comically on her feet.

The gas jet? Points to the gas jet in the room.

Where is your left hand? Points to her abdomen.

All these indicative gestures are executed with greatest earnestness, her joy is excessive, her laugh bursts out amid the most comical movements. Denise often pronounces the word "*aya!*" in pointing to an object, which doubtless signifies *voilà* (here).

Other quite complicated sentences show the extent of her power of comprehension.

Q. Come here.

A. (She comes with her chair).

Q. Do you see the music box which is on the table?

A. Yes.

Q. You will be good enough to take it to the table at the side.

A. *La*— (She does the action).

Q. Will you go and get it and put it in the pocket of M. S. —?

(She brings it from the table.)

Q. Will you be so obliging as to sit down?

She obeys.

Q. Will you put that object in the pocket of M. S.—?

She places it on the table.

Q. Will you give us a little air by opening the door behind me?

She takes the music box.

Q. The order is repeated.

She goes towards the door.

Several repetitions of the order. She wanders about the room.

Q. Will you take a pin and put it on a chair?

She wanders about the room.

Repetition of the order.

A. Pipi.

Q. Pull your ear.

She does it.

Q. Give yourself a box on the cheek.

Her two fists held tight she strikes her extended cheeks.

Q. Pinch your nose.

A. There! (She puts her index finger on her nose.)

Q. Scratch your hand.

She claps her hands together.

Q. Throw your handkerchief in the air.

She obeys.

To other questions she can answer yes or no always nodding her head; her replies are often given with a discernment which proves she has understood. Thus she will say, "yes," if one asks, "Are you a good girl?" "Do you wish a bonbon?" On the contrary she will not fail to reply, "No," if asked "Do you wish to go to bed?"

All these examples show that her verbal comprehension is real although limited and changeable. We have been able to give a quite complicated sentence, "Throw your handkerchief in the air," which was understood. Others were not. Like a child Denise catches one word and guesses at the rest; but at times she catches nothing, so that one cannot foresee even when one knows her well whether or not she will understand a given sentence because her comprehension is very uncertain.

Animal sensitivity to verbal perception. It seems to us that in a certain measure Denise understands like an animal and, moreover, that the acuteness of her verbal perception is very great, much greater than one would have supposed. In the first place she is extremely sensitive to the intonation of the sentences pronounced. When asking her if she is good we can by the inflec-

tion of our tones obtain from her at will either the answer yes or the answer no. We do not know exactly in what the difference consists of the two intonations which we employ with this definite end in view; we can only say that one of them which terminates in a high note tends to suggest an affirmation, while the other, which ends in a lower note and which is like a disapprobation, tends to suggest a negation. Is it not singular that this defective grasps so slight a shade of meaning when she has so little intelligence that she cannot even shell peas but tears them open with her teeth? It is because we have here to deal with that part of the comprehension of language which is not only human but animal. Bear in mind that a dog is also very sensitive to the varied intonations of the voice of his master; he knows very well if he is flattered, if one is satisfied with him, if one is sad, if one reprimands him, if one is angry, and since he does not understand grammatical construction, it is clearly the intonation which guides him. Lubbock has shown that because the dog is an excellent observer it is possible to present him before the public as being able to read and to execute orders written in advance upon a placard. Very curious experiments have been made recently in Germany upon a learned horse that was exhibited in public; this horse divined from the slightest movement of the head and eyes of his master what he was to do, how many blows of his hoof he was to give, or rather, knocking with his hoof a series of blows, he knew when he must stop, etc. Curious the master did not know how his own thought could be divined by this beast! One can easily collect among animals a great number of examples of feats of intelligence which require a very fine perception and a great talent of observation. It is really curious that this fineness of perception, altogether animal, should be found among defectives. Let us hasten to add that the normal individual possesses it also; but he possesses it from birth like the animals; it is a gift which he has not developed.

Denise is also very skillful in distinguishing in a sentence the affirmation or the negation, even though she is incapable of understanding the sentence. Thus, the sentence, "*Isn't it true that there are artillerymen in the artillery?*" provokes an acquiescence; while the sentence, "*Isn't it true that there are no artillerymen in the artillery?*" provokes a lively negation with her head. Denise has therefore perceived in the midst of all these incomprehensible words the difference between "there are," and "there are no."

V. DISCUSSION OF THREE HYPOTHESES UPON THE ABSENCE OF SPEECH IN OUR SUBJECT

Let us now analyze the symptoms which we have just described and attempt to interpret them.

It is evident at the outset that Denise presents an excellent case of dissociation between the faculty of speech and the faculty of comprehending speech, and this dissociation must be brought more clearly to light and then explained if this is possible.

Denise understands very well the words of certain sentences, therefore she must have a certain memory for words; she must have such memory in order to recognize the words pronounced, because, if she did not recognize them, she would not comprehend them; she must also have this memory in order to execute a command which is not immediate but which requires a little time. She is told to go and get a bouquet that is on the table; while she is on the way she must remember for a certain time what is said to her otherwise she could not execute the command and would come back empty handed.

How then does it happen that being capable of recalling a word she should be incapable of pronouncing it? This observation proves above every thing else the independence of these two faculties. Certain authors have insisted that the muscular sense is such an important thing that even to understand a word we partly articulate it. Denise takes it upon herself to refute this exaggerated opinion; this may be true of certain individuals of an accentuated motor type but it has no general value. Denise in fact understands a sentence of five or six words but is incapable of repeating a single one of those words. But this independence of the two functions once verified, it remains to be explained how it happens that this subject has not obeyed the very natural phenomenon of psycho-motor induction, and that, having possession of these words through memory, she has not become apt in pronouncing them. Where is the obstacle?

Let us first note what happens with children and with animals. At eight or ten months a normal child already understands

many words. He does not commence to speak until much later, at fifteen or eighteen months. With the adult also the faculty of comprehension surpasses constantly that of execution. How many unknown words there are whose sense one can divine, sentences complex and delicately shaded that one understands, and that one could not invent or even repeat! Let us take an extreme example: the dog recognizes his name and a dozen other words, as cheese, soup, go out, get away, etc.; and yet he could certainly never bark out a single word. All these facts lead to the conclusion that it is normal for one to understand language long before one can speak.

Is it the same with our patient? This can be disputed. Three fundamental explanations can be suggested; they are fundamental as it seems to us because any others that could be imagined are but the variations of these three.

The first consists in assuming an acquired aphasia. Then one would have to admit that Denise had been stricken with a circumscribed lesion in the nervous centers of articulated language; one would have to admit, for example, if one is a localizer of the old school, that Denise is reduced to the pronunciation of so few words because she has been the victim of an accident, a softening for instance, in the third left frontal convolution. In the hospitals for deaf-mutes, children have been observed who present the unusual association of the two following symptoms; they hear but they do not speak; according to the usual expression under such circumstances they are *hearing-mutes*. It has been admitted that they suffer from a cerebral lesion which has produced in their cases a motor aphasia of articulation. Has our imbecile Denise also aphasia produced by a cerebral lesion? We do not think so. Upon this point, be it well understood, we can only conjecture; only we remark that by her clinical aspect she does not at all resemble an aphasic patient. When an adult who has once spoken is deprived of articulate language by a circumscribed cerebral lesion, one always observes in him an evident contrast between his desire, his need of speech on the one hand, and his absence of speech on the other. With Denise nothing of this kind is observed; she makes no effort to speak. Besides, and this second argument is still more decisive than the first, she has never spoken better than she now speaks; she has not therefore been deprived of a function that she had exercised previously.

A second hypothesis, very distinct from the preceding, would consist in admitting that Denise and subjects who resemble her are stricken with *congenital motor aphasia*. There would also be among idiots, those defectives who do not even understand articulate language, a *congenital word deafness*. These expressions have already been proposed by different authors; but in proposing them, one has not seemed to realize their bearing; it has even sometimes been believed that the expression was the equivalent of saying simply *has never spoken, has never understood speech!* We do not in the least agree with this manner of looking at the matter; and to show the error it is sufficient to remark that it would be an incongruity equal to that of saying of a normal child of two months, who as yet understands nothing of what is said to him, this child is stricken with congenital word deafness; obviously, this would be absurd. Congenital aphasia implies a lack of development of the organs necessary to language, an atrophy sufficiently accentuated to have a really pathological character and to constitute a contrast between the arrested development of the centers of language and the much greater development of the other centers of the same brain. This is truly the only reasonable meaning that one can give to these expressions.

But, in place of the hypothesis of the failure of language through *local accidents* we prefer another hypothesis which brings in the level of intelligence. It seems to us that, exactly like a child of ten months, Denise does not speak because she is not intelligent enough to speak. This last explanation, to which we give our preference, is not of an essentially psychological nature, and we ask that it be not opposed to the preceding, as a psychological hypothesis which would be opposed to an anatomical or physiological hypothesis. It is for convenience of language, and in order to be more quickly understood, that we say that the lack of language of our patient is to be attributed to the inferiority of her intellectual level; this same thought could easily be translated into anatomical terms, and one could say equally well that if there is in Denise an atrophy of the centers of language, this atrophy is neither greater nor less than for that of the rest of her brain. What has been learned up to this time from autopsies made upon the brains of imbeciles points in this direction. We do not know that a special localized reduction of volume in the cerebral centers that control language has been observed among imbeciles.

What are the reasons which make us admit that it is the intellectual level of Denise that is responsible for her pseudo-aphasia? Let us recall first what is beyond all discussion. Denise is a low grade imbecile.

✓ A very strong argument in favor of our explanation results from the comparison of Denise with other imbeciles. We have often said we must not make a study of only one of these subjects, they must be brought together and a synthesis made of all the observations. Moreover we can demonstrate that imbeciles in general speak little; and middle-grade imbeciles especially speak a very limited language; they make very short sentences with rudimentary syntax. The case of Denise, when closely compared to theirs, becomes clear; it no longer has an isolated character, as would be the case if Denise had been the victim of some cerebral accident; one has the feeling that with low grade imbeciles a lack of the development of language reigns supreme, and that Denise has carried this common trait to its maximum.

VI. THE PSYCHOLOGICAL CONDITION OF SPEECH; EXPERIMENTS AND THEORY

A skeptic who had followed our discussion might say, "You take a great deal of pains for nothing. By a great reinforcement of arguments, you have demonstrated that if your patient does not speak, or speaks very little, it is because she is in the same mental state as a little child of from eight to twelve months who also understands many words but does not yet speak. For the general study of imbecility no doubt it is an advantage to demonstrate that the lack of language among these patients depends upon the weakness of their intelligence. But you do not wish here to pose as a clinician, you are using only psychology; you are seeking to discover the psychological conditions of the formation of language. Therefore why should you take an imbecile for study when all your effort will consist in concluding that these things take place in her as though she were a little normal child. Would it not be more simple, more clear, more decisive to leave your imbecile, and confine yourself to the study of the normal child?"

It is very evident that we have made these objections to our own method because we know how to reply to them.

It is very true that children understand the language of those about them long before they can speak; and it has always appeared logical that the phase of comprehension always precedes the phase of speech although the two phases overlap each other. This chronological order is reasonable; before giving one must receive; before pronouncing a word one must know it. But one has never gone farther than to affirm the logic of this chronology, and the very pretty problem which is there posed has not been seen, because one thought only of normal children. Here is the problem stated in explicit terms. A child of twelve months, for instance, understands the sense of some sixty words which he hears almost constantly. Why does he not spontaneously pronounce them on his own account when he has the idea to do it? It seems to us that this problem is fundamental, because it puts directly

before us the psychogenetic conditions of speech; but those who study only the normal child never dream of putting it; they simply say, "Give the normal child time to familiarize himself with the 60 words which he understands but cannot yet pronounce." Or one will reply, "If he does not yet pronounce the words it is because he does not yet feel the need, that he has not the idea, etc."

These replies only evade the problem. One sees this very well when one deals with an imbecile such as our subject Denise. Here is a young girl of twenty-five years, who certainly understands more than two hundred words even in complicated sentences and who employs scarcely one, and who will probably remain all her life at the stage of comprehension without being able to arrive at that of spontaneous speech. Evidently one can not in a similar case reply that the subject has not yet had time to perfect herself or that she does not pronounce these words because she has not yet felt the need. Neither can one be content with remarking that her intelligence is the cause, and that the poverty of her vocabulary is explained by a falling away of her intelligence; the intelligence is a unit and the explanation lacks precision. Let us strive to find, therefore, what is essential to spontaneous speech and let us see whether or not this essential mechanism is lacking in our patient.

We are obliged to resort somewhat to theory, for which we apologize, but it cannot be dispensed with. In order to institute an experiment as is our intention one must have a little guiding thread.

It is a question of pronouncing a word oneself, a word known to everyone, but in which one takes the initiative. Let us say, in order to fix our ideas, that it is the question of a word designating an object before us, a chair or a table; let us say that our subject is not alone but is with another person who shows him the table, and who asks, "What is that?" Let us further say that our subject understands the sense of the request made of him, and let us pass by all that is implied in that comprehension, and limit ourselves to the pronunciation of that simple reply which should be given, "a table."

For the subject to be capable of pronouncing this simple word properly under the given conditions so that it will be easily understood, many conditions must be realized. Let us enumerate all those which we can imagine.

1. It is necessary to know and to understand in a general manner that words serve to designate objects, and that their function is to name objects. This knowledge, expressed in abstract form, appears subtle; but it is only subtle in our manner of expressing it and of taking it into account. In reality, it is accessible to very rudimentary intelligence, since domestic animals understand the language of gesture and even of words. Recently a dog has been reported who obeyed the command, "Go and bring my slippers."

2. The second condition is more precise; it is necessary to possess an association of a certain nature uniting definite words to definite things. It is necessary that the word chair be united in memory to the chair, to its visual aspect, to its use, in such a manner that when one pronounces the word before the subject, this person has the idea of its signification. We have however seen that comprehension always precedes spontaneous speech.

3. Another association must also exist, which acts in an inverse sense, that is from the idea to the word; it is necessary that when the object is perceived, or conceived, this perception or this idea should be able to awaken the memory of the word and produce the *mental evocation*.

4. One must have the power of pronouncing the word, that is to say of executing the phonetic movements necessary for its articulation.

It will be noted that in this brief analysis, reduced to the maximum of simplicity, we have not had recourse to the hypothesis of motor images of articulation. Do such images exist? It may be doubted. In any case it is of no interest here to raise a difficult question which we can easily afford to pass.

Let us now return to our imbecile, and let us see what it is that prevents her from speaking spontaneously. Is it the evocation of the word? Is it the pronunciation?

Her pronunciation is defective, certainly, and there is here perhaps a slight obstacle to the development of her language. But we can eliminate this obstacle in certain precise experiments and see what is produced in consequence. In this manner we could convince ourselves that her difficulty in articulation in nowise prevents her from speaking. Let us take advantage of the fact that she pronounces correctly and easily the word, "papa" in echolalia, that is to say when it is pronounced before her. There

is no difficulty of articulation with this word; let us use it then for our experiments.

We take a music box which we find by chance upon the table of our office where we are with our imbecile; we show the object to her while saying and repeating over and over, "You see what I have here? You see this object? You see it? See what it is! Look well at it! I am going to tell you what it is. You don't know what it is? I am going to tell you. Well it is papa. Do you hear? It is papa! Papa! Papa! It is papa!" We continue thus with ardor to repeat the same words, all the time moving the object, looking at it, pointing to it, and making every effort to fix the attention of the patient upon the object.

Denise, who is amused by the play, repeats after us "papa," and we even make her touch the music box, while repeating after us the same word. We thus succeed in quite rapidly forming an association between the object and word. If in fact we ask her some time afterwards, when we have replaced the object on the table, "Where is papa? Give me papa," she points to the music box on the table without hesitating, although there are a dozen other articles upon the table, and although we do not facilitate the designation by a gesture or a glance towards the object. But this association which is formed is unilateral. If we take the music box and say, "What is this? What is this called?" She never says "papa," she says nothing, she stands with her mouth open.

Let us first examine this unilateral association. It has undergone many fluctuations. Three minutes after the experiment it seems to have disappeared. If we again ask her where is papa, she points to one of us. In response to a sign of disapprobation, she points to the table and puts her finger insistently upon the table; all the time that we repeat the question, "Where is papa?" she replies "aya" while designating either the table or the cloth on the table; she even identifies the table, it would seem, with the memory of her real father, and leans over and embraces the table with comical expressions of affection. Our lesson is therefore forgotten. We begin over again presenting the music box, which is there all the while, and we affirm over again that it is papa. Denise immediately accepts the correction, begins again to show the music box when one asks for papa, and even embraces the object devotedly as she did the table.

From this moment the association is established. Five minutes

afterwards when one asks for papa, she shows the music box without hesitation and embraces it. Even better, two days later we see Denise again in the same surroundings; and immediately before saying another word we ask, "Where is papa?" Without hesitation, she turns to the table, takes the music box and gives it to us. Note carefully that every time we make the demand we are very careful not to cast a glance toward the object which might guide the patient. There is therefore established in her, thanks to the experiment which we have made, an association of ideas which goes from the word heard to the object.

But never, when we present the music box, has she said "papa;" no more at the second than at the first sitting. She contented herself by replying to the question many times repeated, "What is this?" by "yes," or else she taps the object laughing, and pronounces nothing. Perhaps one might have secured better results after many weeks of training. But as it now stands our experiment seems to us to be complete; it demonstrates that to pass from the object to the name, our subject experiences a very much greater difficulty than to pass from the name to the object, which is the important fact we wished to demonstrate.

Nevertheless it is not the pronunciation of the word that embarrasses her; she has no difficulty of articulation, because she repeats the word papa, after having heard it; moreover one can obtain its repetition from her in all sorts of intonations; still more, one can lead her to repeat it when it is pronounced before her in a whisper; and it has even happened that when we pronounced before her the word "mama" in a very low voice, she had nevertheless said papa. She can then pronounce the word from repetition, or more rarely from suggestion by a movement of the lips; it is inductive evocation excited by audition or by seeing the movement of the lips.

✓ What is lacking in her, is *the evocation of the word by presentation of the object, that is to say, through lack of the idea of sense.*

Here then is the conclusion at which we arrive; it is a conclusion which, from the psychological point of view, note this well, does not bring into play any special memory, nor any of the images which have been so much used and abused in the different theories of aphasia and which have for this reason taken on such an artificial character. From our point of view there are three necessary stages in the acquisition of language.

1. The comprehension of words, of which we shall say very little here, and which, roughly speaking, consists in associating the spoken word with the idea.

2. The articulation of words consisting in the habits acquired by the organs of articulation under the supervision of the ear and the auditory memory.

These two phases succeed each other but the second is not implied in the first nor is it the logical development of it. The word that one hears and that one understands is not the same that one pronounces. In the one case it is a question of an auditory sensation or of an auditory memory, and in the second case it is a motor act. It is therefore quite possible that one may have heard and may be capable of representing or of recognizing what one has heard, without for that reason being clever enough to coördinate the movements necessary for pronouncing. Exactly as it is possible that one might have seen an artist paint a picture and yet be incapable of painting. There is therefore a whole apprenticeship to be made, and we see or rather we infer that for many reasons this apprenticeship is long and consequently the advent of spoken language is retarded; the phonetic movements are very much more delicate and probably very much more difficult to execute than the gestures of the limbs; and the proof is, that the idiot and the low grade imbecile, who have become capable of executing movements of the body under our order, such as to get up, sit down, raise the arms, etc., do not succeed in controlling their larynx and in drawing from that instrument articulate sounds. That which further proves the difficulty of articulation as compared with other movements, is all the awkwardness of pronunciation which we observe in subnormals and which are much more frequent among them than among normals.

3. The third phase is the evocation of coördinated movements of the larynx. This evocation is difficult and continues so even when the movements have been acquired with their coördination and one is already able to pronounce a word. The most simple and direct means of evocation is the audition of the corresponding articulated sound; another means is the sight of the movement of the lips. It is, on the contrary, very much less easy to pass from the idea of a thing to the execution of the phonetic movement necessary for naming that thing. We ourselves can realize this difficulty when, thinking of a known person, we have trouble

in recalling his name; it must be that this difficulty is really great since it is sufficient to block the way for Denise and prevent her from ever employing articulate speech.

It is this third phase, up to the present misunderstood or at least little known, which has been clearly brought out by the observation of our imbecile. It is a phase having a character of utilization, a dynamic character. If we attempt to represent what is passing in the mind of Denise at the moment when we are vainly attempting to make her give the name with which we have baptized the music box, we find that not a single one of the elements necessary for finding the name is lacking. She knows the word *papa*, since she has already heard it and recognized it; this proves that she has retained the auditory memory of it; she is capable of pronouncing the word, since she pronounced it in echolalia; she has retained the sense of the word, since she goes and gets the music box when she is told to show us *papa*. It can be seen that an author, partisan to the importance of images in aphasia, would recognize that all the images are here present. What is lacking is the realization of the existing associations, the functioning of established habits, the particular mode of functioning which enables us to pass from the idea to the phonetic act.

VII. COMPARISON BETWEEN APHASIA PROPERLY SO-CALLED AND THE POVERTY OF LANGUAGE OF THE LOW-GRADE IMBECILE

It has often been said that certain idiots and imbeciles deprived of speech are aphasics; we ourselves in studying certain of our subjects, Denise for instance, the young woman whose speech is reduced to four or five words, have discussed the idea that she might be stricken with some cerebral lesion which has produced in her the symptoms of motor aphasia. Our conclusion has been negative. Abandoning our patient we are now going to examine a true aphasic from cerebral lesion and make on this occasion a parallel between the aphasia symptoms produced by lesions and the symptoms of the lack of language observed with idiots and imbeciles.

M. X.—a man of thirty nine years exercising the profession of clock maker was stricken about a year ago with aphasia. We have only this single bit of information in regard to him. He presents himself to us with all the outward signs of a man of intelligence. His manner of salutation, of taking the proffered chair, of listening to us is quite different from that of an imbecile. If we speak to him he leans forward and makes a visible effort to understand us and if he does not understand he lets us know by an expressive gesture that he desires us to repeat. From time to time he himself starts to speak; he makes many gestures with great earnestness, even rises to give more force to his exposition, touches the table, indicates certain points of the table, then of his body, but since his vocabulary is reduced to six or eight words we are not able to grasp his thought. From time to time he perceives that he has not made himself understood, or rather he perceives that the word sought for fails him, because in the middle of his efforts, he stops and says in a grave discouraged voice, "No, not that," then he falls into an immovable and resigned silence. We note also that when he speaks in his own way, he continues to do so only because we appear to be listening to him. If we turn away our eyes or speak to another person he

immediately perceives it and is silent, possibly from a feeling of propriety. All these signs prove that he retains an intelligence very superior to that of an imbecile. The only point where the subject seems to lack comprehension is this; the explanations which he gives us by gesture are practically incomprehensible to us, and yet he does not always seem to perceive this; he seems to imagine that we can understand him.

A word upon his intelligence in general. We possess two tests of intelligence not dependent upon speech, which indicate an intelligence superior to imbecility; these are the arranging of five weights and a quite complicated game of patience. No one lower in intelligence than a moron can place the 5 weights in order; and the game of patience is only possible to a high grade moron. Our aphasic came out well in both tests although he was slow in the execution. He found it difficult to weigh the weights two by two so as to find the heaviest but once well begun he succeeded in arranging them exactly. The game of patience also embarrassed him but he studied it with intelligence and after many fruitless and prolonged attempts he at last arrived at the exact solution. All this proves that his intelligence is notably superior to that of an imbecile; it is at least equal to that of a moron.

Let us now make the analysis of the aphasic phenomena which this patient presents. He is especially stricken with motor aphasia or aphemia; he is moreover incapable of reading, or of writing from dictation, and is in the third degree of word deafness. Let us remark at once that this combination of aphasia symptoms recalls in a striking manner what we noticed in the observations of our imbecile Denise.

Articulate speech. Spontaneously our invalid employs a very limited number of words: "yes, no—that, yes—that, no—no—that, yes—that, no—I—wait—" are the current expressions with which he accompanies his gestures when he wishes to give an explanation. From time to time he utters a word more complicated as *comrade*, *clock*. Of course we do not pretend to give a complete list of the vocabulary which he still retains; the important thing is to notice how much it is reduced in the *spontaneous speech* of ideation which consists in expressing a personal thought. X— retains a few more words in the *speech of automatic recitation*, which consists in repeating words learned in a series, than in spontaneous speech of ideation. It is

thus that he manages to count aloud to twenty; this recitation is performed with a great deal of effort and with much time, but very correctly. There is here an interesting contrast with the spontaneous speed of ideation. We will say the same of the *speech of denomination*. If one presents to him a familiar object, pencil, pen holder, book, watch, paper, or asks him the color of an object, X—— sometimes is ignorant of the name of the object, or gives up trying to find it, or gives a name, sometimes correctly, sometimes a name closely allied (clock for watch, pencil for pen holder). The speech of denomination is therefore a little better conserved than that of the spontaneous speech of ideation.

There remains a last form of speech, the *speech of repetition*. X—— cannot repeat a sentence and if one is proposed to him, he does not repeat it at all; but he repeats exactly a simple sound, as for instance simple vowels; the sound he emits, without being always pure (*u* resembles *eu*) is nevertheless recognizable. He can also repeat a single syllable *pa* and *ba*. But he cannot repeat a polysyllable word like *papa*; moreover he can repeat a single figure, but repeats two with difficulty and never three; and it is all the more surprising since, as we have just seen, thanks to the speech of automatic recitation, he can articulate in a series all the figures from one to twenty. It is not therefore properly speaking the articulation of the different figures that presents this difficulty to him, but rather the representation, the memory of the three figures to be repeated.

One might say that X—— repeated like an imbecile. There is here certainly a most important point to notice. X—— resembles really very many of our imbeciles who speak a little, can repeat a figure or two, but never three.

Word comprehension. There are, it seems, two forms to distinguish in verbal audition. The first could be called the *verbal comprehension of ideation*. One speaks to a person and this person, thanks to the words which he hears, understands the thought. With X—— this form is conserved, but it is deeply affected. He understands certain sentences; as for others he slightly misunderstands them. Thus we say, "Carry an object to the nearby table," and he understands, "next room;" he opens the door, crosses a corridor and with much seriousness carries the object into another room. He executes very well certain orders as "Open the door." But at our command he cannot point to his nose,

mouth or ears. He seems to understand that it is a question of his face. But his hand wanders over his features with indecision. On the other hand he has better *verbal comprehension of objects*. We have just seen that he cannot find his ear when it is asked of him; but if we touch his ear, and ask him, "Is it a pen holder? a horse? a dog?" he replies everytime with great deliberation and as if after long reflection, "No, not that." And when one pronounces the word ear, his eyes brighten, and he is overjoyed to say to us with many gestures, "That's it." Under certain circumstances in order to find the name of an object, we have seen him resort to a union of two processes, which we have called the speech of automatic recitation and the verbal comprehension of objects. One writes before him the number 12 and asks him what it is. He counts 1, 2, 3, etc., until he reaches the number 12 (automatic recitation) and there he stops, compares the word 12 to the symbol he has under his eyes, (verbal comprehension of objects); he finds an agreement between the word and the figure, and affirms energetically "12," putting his finger on the number.

As to writing, he possesses only *the writing of automatic repetition*, he writes his name; he has not *spontaneous writing of ideation*, *copying*, or *dictation*. Reading does not exist; it is lost.

Let us carefully note that in the preceding descriptions we have paid no attention to the inner language of our subject nor to the state of his images. We have voluntarily set aside these difficult and perhaps artificial questions subject to innumerable interpretations. Let us limit ourselves to making the most of the objective symptoms which we have noted. We can arrange them in a particular order which corresponds to the degree of their decreasing conservation, the first of the list being the best preserved.

Speech of automatic recitation		Writing of automatic repetition. (Signature)
Speech of the denomination of objects	Comprehension of denomination	
Speech of ideation	Comprehension of ideation	
Speech of repetition		

There exists then a very clear order in the appearing of these symptoms, and this order seems to be the same for speech, com-

prehension, and writing. Thus the speech of ideation is more difficult, more unstable than the speech of recitation; and the speech of repetition is the most unstable of all. This instability seems to be a fact of observation which we must accept without trying to explain it by any theories. If further investigations confirm our classification this then is the hypothesis which can be put forth.

The production of aphasia would then be dependent upon two principal factors; the seat of the lesion, and the greater or less degree of integrity of the nervous organ affected. It is the seat of the lesion which determines the *form* of the aphasia, rendering it motor or sensorial, or explains the complexity of the form of the aphasia, which may be partial or total. This form once determined, it remains to determine the degree of the aphasia; and it is here that the distinction of degrees which we have just indicated comes in; there is, for the three species of language, a hierarchy of different degrees; the more complex are lost first; the spontaneous speech of ideation for example would be lost very much before the speech of automatic recitation. The speech of suspended repetition also long before the speech of automatic recitation.

But if observation confirms this hypothesis, it is probable that curious analogies will be found between the state of aphasia and the state of speech among imbeciles. Without doubt certain forms of aphasia present themselves which have nothing analogous to what is found in imbeciles, thus sensorial aphasia appears in diverse phenomena, notably in word deafness, in subjects who continue to have the power of speech. The malady has produced a lesion, which operates in a sense the reverse of psychogenesis, because one begins to understand before one begins to speak, and no imbecile can exist who, by his own lack of intelligence, could present anything analogous to sensorial aphasia; that is to say, who would speak without understanding the spoken words. It is not by the *form*, that is to say by the nature of the function attacked, that the imbecile resembles the aphasic, but by the degree. One function being affected, let us say for instance speech, the series of the degrees of alteration which the aphasic would present will be a psychogenetic series, whose general gradation will be found exactly repeated in the imbecile. This at least is the hypothesis which we formulate.

VIII. THE FUNCTION OF LANGUAGE AS A SIGN OF HUMAN INTELLIGENCE

Among the physiological definitions of man, one of those most often cited consists in considering the use of articulate speech as the most characteristic mark of the human. The philosophers have started from this point to exalt the beauty of the function of language; and it has even seemed that it required nothing less than the whole human intelligence to render speech possible. Abstract studies that have been written upon language have sustained this illusion. In reasoning upon this function, they have sought to present it as a wonder of reflexion and elaboration. Currently the psychologists have maintained that language results from an implicit convention, consisting in the use of words as signs, substitutes, symbols of objects and of thoughts. In other words, language would suppose an intelligence capable of perceiving a general relation between things and their verbal signs.⁵ Presented under this form, the idea which is held to have presided at the formation of language seems so complex that one is not astonished that animals are incapable of it and consequently are deprived of language.

Other conclusions, obtained by investigations in the clinical domain, have lately added their weight to the preceding. We allude to the work and theories of Marie and his pupils.⁶

Marie sought, by a series of observations and of autopsies, to renew the conception of aphasia. We do not speak of his ideas upon the seat of this lesion, but only of his physiological observations. He asserts that, "with all aphasics there exists a very marked diminution of the intellectual capacity in general," and that neurologists have committed a grave error, in declaring in

⁵ To our minds this is establishing a confusion between the perception of a relation and its realization. It suffices that the relation is realized in order that language exist.

⁶ See *L'Année psychol.*, vol. XIII, p. 344, an account rendered by Bernheim of recent theories of aphasia. The short original articles of Marie, appeared in the *Semaine médicale*, May 23, 1906 and October 17, 1906. Cf. Thèse de Moutier, *Aphasie de Broca*, Paris, 1908.

their definition of aphasia, that "the intelligence is intact." He even declares that, for his part, if he had to give a definition of aphasia, the fact which above all else he would endeavor to bring out would be the diminution of intelligence. He warns us against the apparent intelligence, which aphasics may present in consequence of the fact that they retain the power of mimicry, the emotional faculty, and the sentiment of propriety; with great reason, he affirms that the intellectual deficiency of aphasics may escape a superficial view, and he demands a methodical examination of his patients.

We shall speak in a moment of this examination, and we shall discuss the procedure and the results. But first of all what rôle does Marie assign to the intellectual deficiency of aphasics? Upon this important point we regret to assert that his thought remains vague. Or, to speak more clearly, we believe that in these two articles he has changed his point of view. He reproaches the clinicians, who have recognized this deficiency, with considering it as an accessory phenomenon, and with being very wrong in not taking it into account when constructing a theory about aphasia. This criticism would seem to suppose that for Marie the deficiency is not a coincidence, but an integral part of the aphasia.

In the first article he writes expressly in regard to sensorial aphasia, or aphasia of Wernicke, that if these patients speak badly, have jargon aphasia or paraphasia, it is "in consequence of intellectual decay;" this decay would account for their so-called word deafness and their incapacity to read and write. Note carefully that the theory thus sketched is very significant, for it applies not only to the aphasia of Wernicke but also to the aphasia of Broca, which would only be, according to the same author, a sensorial aphasia complicated by *anarthria*.

Let us now pass to the second of the articles cited; there Marie seems to have moderated his first thesis, or rather to have completely changed it, because replying to Dejerine who called his attention to the fact that demented and general paralytics, in spite of their intellectual deficiency, do not become aphasics, he does not hesitate to object that there may be some dissociation in the intelligence, and he admits that the "intellectual deficiency of the aphasic is specialized." He says again, that the "gamut of intellectual decay is singularly varied, as much from the point of view

of the quantity as of the quality," and he adds, what everybody will regret, that he has not the possibility of expatiating further upon this order of ideas.

In fact this last concession, that the deficiency of aphasia is *specialized*, seems to destroy what there is of psychological originality in the theory of Marie; because if one admits that only that part of the intelligence of the aphasic which relates to language is affected, one returns more or less implicitly to the ancient theory which makes aphasia a disturbance of the function of language. Without wishing to insist farther upon this particular point, we shall speak upon the question of how it is that Marie seems to have affirmed in the beginning, as his contradictors have believed that he affirmed, that the loss of language is due to a diminution of the intelligence.⁷

The least criticism that can be made of these hypotheses is to accuse them of vagueness in not determining the amount of intelligence necessary for speech. Not only are the conclusions vague but still more one finds numerous suppositions that are not demonstrated. Marie, for instance, affirms that an aphasic, a cook by trade, cannot cook an egg as well as before the appearance of his aphasia; in concluding that it is his intellectual weakening which explains, in part at least, the loss of speech, one might make this unverifiable supposition that the intellectual weakening is sufficiently profound to render language impossible. We borrow another example still more disputable from the same author; he affirms in some experiments, which are by the way of a very interesting originality, that one of these aphasics is incapable of performing three commissions which are given to him simultaneously, either verbally or by gesture; this aphasic always forgets one or two of the three. We admit that this proves that he is weakened from the intellectual point of view, but is such a weakening sufficient to explain the loss of language? This is the whole question.

⁷ The doctrine of P. Marie upon aphasia, says Dejerine, may be summed up in the following terms; sensorial aphasia is not a consequence of the destruction of the sensorial images of language, because the author does not regard the existence of these images as proven, *and all the symptoms that one encounters among patients are according to him due to a single and only cause, the diminution of the intelligence.* (Dejerine, *Medical Press*, VII, 1906.)

In order to answer this question we think it necessary to make a distinction between the quantity of intelligence necessary for the formation of language, and the quantity necessary for the conservation of language already acquired. This last case could be studied in senile dementia and general paralysis; we limit ourselves to that which concerns the formation of language.

If we have recourse to our measuring scale of intelligence, we shall readily see that a normal child of six years easily performs three commissions; but even at two years he speaks and understands; one sees therefore that the intellectual level of the test for three commissions is very much higher than the intellectual level which suffices for the formation of language; the superiority amounts to four years. It is in this manner that we must study dements, whether or not the facts are favorable to the thesis which rightly or wrongly has been attributed to Marie.

One great interest in the study of children and also of imbeciles is that we can bring precision into these questions of intellectual level, which have always been treated with a vagueness altogether amusing. By the examination of a series of idiots and imbeciles it is possible to establish, with all the approximation desired, what amount of intelligence is necessary for speaking and for understanding, or at least, we establish by this method the condition of the intellectual faculties among defectives who can not talk, and those who use only a few words. These belong to very different levels. In this way one can establish upon an experimental basis a hierarchy of psychical functions which until now has never been done.

The impression which one receives from these new affirmations is that the quantity of intelligence necessary for the use of speech has been very much exaggerated. Denise, who is at the dawn of language, is a low grade imbecile. Below her there are only idiots, those who do not speak; they are sensitive only to the language of gestures. But what is their intellectual level? We doubt if it is greatly superior to that of an intelligent dog; superior perhaps from certain points of view, inferior from others. The idiot of the highest degree is capable of obeying a gesture, and even of imitating a little; if one claps the hands before him or dances or cries, he is capable of understanding that we wish him to imitate these movements, and he is capable also of making a crude imitation. This is the highest test of intelligence that we

have been able to give them. Let us now pass to low grade imbeciles of the type of Denise who have the beginnings of articulate language; women of this type cannot do their hair, nor prepare vegetables; but they can dress themselves, sometimes however, putting on their clothes wrong side out. They are capable of mechanical work which requires no discernment. We have seen an imbecile man of this level who earned 20 sous a day blowing the bellows of a forge. Put a pen in their hand they cannot even copy a square; they do not understand the request, they cannot conceive of copying, or in any case all their attempts at copying are absolutely formless. It seems useless to give more details in order to bring out the veritable *intellectual level necessary for the formation of language*. It is sufficient for the moment that we have summarily fixed this level, and that we have demonstrated that with other experiments it can be determined with a very great exactness. The essential was, however, to have demonstrated that it is determinable. We also wished to show that it is a very low intellectual level corresponding to low grade imbecility.

IX. THE EVOLUTION OF LANGUAGE

The possibility of placing in an ascending series the intelligence of different imbeciles, thanks to the method which we have set forth, has had the happy result of facilitating the study of the development of language among defectives. This is a question altogether new which we are simply going to outline.

Let us note first of all that the lowest grade imbeciles represent the beginning of language; at this level there are no sentences but only words. The imbecile that we have studied at length, Denise, speaks only words. We have encountered two other low grade imbeciles in the same condition. Furthermore, it is very possible that this is not an absolute rule, and that the function of language develops sometimes a little earlier, sometimes a little later. In order to know this, it would be necessary to examine a great number of subjects.^a

Let us remark that the words pronounced separately by these imbeciles are mostly nouns, at times adjectives, and even verbs. Are these grammatical distinctions very important? Or rather is not the most important matter to note that these distinctions are without interest? The grammatical function of words should, we believe, be taken into consideration only when it has a definite meaning to those who employ them. But it is very evident that when one of our imbeciles employs a single word, that word does not perform the function of verb, or of noun but of a whole proposition. The adjective *bad* (mal) used by one of them signifies "I feel bad" (J'ai mal), and the substantive *mama*, means "Mama gave me this or that."

Let us come to a higher level and consider imbeciles who are capable of making sentences. Our observations are on an imbecile of fifty, named Victor.

Victor is a man of robust aspect, tall, square shouldered, bronzed

^a An attempt has been made by M. Maupaté (*Annales médicopsychologiques*), but the absence of all seriation among his subjects has very much reduced the interest of the notes upon his experiments upon which his work is based.

skin full of wrinkles, and the manners of a working man; one would say an old sailor; his head is well formed, the features are regular, and the expression of his countenance seems to show more intelligence than the poor fellow really has. But he is awkward in his movements; and even when he remains quiet, whether standing or sitting, one recognizes in his attitude something—I don't know what—that is peculiar. Since this subject has the use of language let us make him talk a little.

Q. What is your name, my friend?

A. Victor.

Q. From what place do you come?

A. Châtenay.

Q. Where is Châtenay?

A. Near Sceaux.

Q. Is there a large city near Châtenay and Sceaux?

A. Versailles.

Q. And Paris? You know Paris.

A. Yes, monsieur.

Q. What is Paris?

A. To go to a sale. (He seems satisfied with his reply.)

Q. But besides that what is Paris?

A. To buy there merchandise.

Q. And where is it?

A. There. (He indicates any direction.)

Q. What is your trade?

A. Tiler.

Q. You go on the roofs?

A. Yes, monsieur.

Q. You have fallen?

A. Yes, monsieur—There (He points to his head with earnestness, and an air of self-pity, to show where he received a hurt in falling.)

Q. How much do you make as tiler?

A. Sixty francs.

Q. Every day?

A. Every day!

Q. (With a tone of correction) Every month?

A. (Eagerly) Every month!

Q. What was the profession of your father?

A. Tiler.

Q. And your mother, what did she do?

A. Worked among people.

Q. Ah?

A. Washed the dishes—sewed.

Q. Are your parents living?

A. (With a shade of sadness) They are both dead—long ago.

Q. How long ago?

A. A month ago.

Q. Why did you not continue to be a tiler?

A. Not much work—all the iron merchants—tilers.

Q. You have a sister?

A. Yes, sir.

Q. Your sister is older than you?

A. Older.

Q. Or younger?

A. Younger.

Q. What does she do?

A. Seamstress.

Q. What does her husband do?

A. Watch merchant at Enghien.

Q. Have they children?

A. (Shade of sadness) They are dead.

Q. Come now, tell me about your sister. Give me details. What does she do?

A. Sews—all the time—with the sewing machine.

Q. And then?

A. Goes to the city to carry the linen.

Q. And then?

A. She fixes my shirt—socks.

Q. Tell me something more.

A. Don't know any more.

Q. Oh! yes, think.

A. I don't remember anything.

Q. What did you do this morning?

A. Brought the soup.

Q. And after that?

A. Brought the bread and the soup.

Q. And after that?

A. Eat.

Q. What else have you done?

A. Brought the drink.

Q. And then?

A. Eat.

Q. What do you know how to do?

A. (With pride) I can put wine in bottles.

Q. All alone?

A. All alone.

Q. Really.

A. Never broken a bottle.

Q. Are there others who can do that?

A. No, only I can.

Q. M. Simon (who is present), could he fill bottles?

A. I can show him.

All this dialogue goes on without irony, at least on the part of Victor; he is attentive, remains several hours sitting beside us, and concerns himself only with us; he is very much less distracted than Denise who often gets up during the conversation to go to the window to see what is passing outside. He has a serious, conscientious, convinced and deferential attitude, especially during our first sittings. Little by little he familiarizes himself with us to the point of forgetting the feeling of conventionality, as would a school boy with whom one had the imprudence to joke too much. But this manifested itself only in subsequent sittings.

Determination of level. It is evident from that which precedes that it is here a question of a quite low mental level. But this is only an impression and we cannot content ourselves with this sort of medical subjectivity. These general questions by which one very properly commences an examination in order to find out a patient's general condition, have no other purpose than to enable one to judge of the whole; this is excellent, necessary, and even indispensable. If one begins the examination of a subject by a precise *test*, he will not arrive at an idea of the whole; he would perform a task as ridiculous as though he studied geography with a microscope. No method is good except when one employs it at the opportune moment and to the end for which it is designed. Our general interrogations have given us the suspicion that, in Victor's case, there is a reduction of all the faculties, a *global* reduction. An analysis of detail which would have been out of place in the beginning must now intervene in order to bring precision into particular points.

Imbeciles like Victor, of the middle grade, can compare two lines and two weights. Victor is clearly of this grade. If the two lines are presented to him he understands, after explanation, what is asked of him and indicates exactly the longer line. He shows the same exactitude for the weights. He does not make a mistake, even sounds the box by shaking it near his ear, and easily finds the heavier (comparison between two boxes of 3 and 15 grams). He is consequently in the middle grade of imbecility. Can he raise himself to the highest grade of imbecility?

For this level one must be able to repeat at least three figures, execute three commissions at one time, know fairly well the names of the pieces of money, the colors, the cards, know his age, the number of his fingers, and other analogous things. This is about

the stock of ordinary knowledge which a high grade imbecile is able to acquire. In spite of his fifty years of existence Victor has not yet been able to assimilate these.

The repetition of figures is never correct; he can never repeat three exactly; he is mostly satisfied to repeat one, the last of the series. At times he gives two, but transposes them; but three figures are above his capacity. It is not willingness however that is lacking. He is very attentive during the test, and listens to us with his eyes fixed upon us.

For the three commissions he nearly executes them; but he does not entirely succeed. He is told to give the bouquet to M. Simon, to carry the umbrella to M. Binet, then to carry his chair near the window. He does the first two and seats himself satisfied. "Is that all?" we ask him; he thinks again, gets up and takes the chair where he was told. In another experiment he forgot the first two commissions and remembered only the last. His exactitude varies then from time to time; but it is evident that one could not place confidence in him to execute punctually three commissions; in this regard he would not be utilizable.

Let us continue the examination of certain useful acquisitions of the high grade imbecile and we shall see which are lacking in Victor.

He does not know the number of his fingers. To the question, "How many fingers have you," he replies,

A. Five (another time he replies three).

Q. And on the other hand?

A. Seven.

This would be simply absurd if he understood the meaning of the words; but he has not the slightest notion, nor does he care in the least. As to his age, he has the same indifference in the use of words whose sense he does not realize.

Q. What is your age?

A. Don't know, monsieur.

Q. Are you two years old?

A. Yes, monsieur.

Q. Or, rather, perhaps you are a thousand years old?

A. Yes, monsieur.

He can recite, without too many mistakes, the figures from 1 to 10 sometimes skipping a figure; above 10 he makes many omis-

sions and many transpositions. Here for example is a series he once gave, with a perfectly serene gravity; 6, 7, 9, 10, 11, 14, 17, 9, 7, 11, 14, 17, 32, 35, 9, 17, 11, 14, 11, 17, 11, 14, 20, 32, 33, 44, 20, 32, 20, 32, 35, 20, 24, 20, 24, 25, 12—What repetition, what perpetual beginning over again done with complete unconsciousness! Notice also that certain numbers are repeated very much oftener than others.

He cannot make the simplest additions.

Q. 2 and 1, how many does that make?

A. 2.

Q. 5 sous and 1 sou, how many does that make?

A. 1 sou.

Not only are the errors so great as to be absurd but when one is that ignorant it is absurd to make any reply. This is what we have called "no-matter-what-ism" (*n'importequisme*).

This tendency shows itself also when pieces of money are given to him to name; there is only one with which he is entirely familiar and in naming which he never makes a mistake; it is the ten sous piece. "That" he says with energy, "to buy a package of tobacco, ten sous." When his sister comes to see him on Sundays she brings him regularly a ten-sou piece to buy his tobacco. These are things that stamp themselves indelibly upon his memory. The other pieces receive the most diverse names, and the names vary from one moment to another; a 1-franc piece is generally called 20 sous; a 2-franc piece is also called 20 sous; a 5-franc piece is called 1 franc, or 2 francs or 3 francs. A 20-franc piece is called 1 franc or 3 francs; and even the modest sou is called sometimes 1 sou, sometimes 2 sous. It is therefore difficult to determine the exact knowledge of Victor, because he by no means has an exact knowledge. He has a vague knowledge which is rendered fantastical by his tendency to say the first word that comes to his mind; it is not absolutely the first word for it is the name of some piece of money; but whether that name is correct or not truly makes very little difference to him.

To count is for him equally impossible. He seems not to have the least notion of numbers although he can recite their names fairly well; but to recite them while applying them to objects is a very much more difficult operation. We beg him to count his fingers; he touches only four and recites 2, 3, 5, 7. He therefore

believes he has 7 fingers. We ask him, "How many ears have you?" he replies "two, there and there" (at the same time touching them). We rise to make a ridiculous demonstration and we say, "No, you have three!" But the suggestibility is so great that we have no need of demonstration, and he replies at once, "Three."

We ask him for 12 pins. He takes a handful out of the box and gives them to us. Another request, "Give me 3 pins." He again picks up what he can hold between his thumb and forefinger, and believes he has fully satisfied our request. It is evident that the numbers 3 and 12 do not in the least disquiet him. We spread 5 pins before him and ask:

Q. How many pins are there?

A. 4.

Q. But no, count them.

A. 2.

Q. Begin again, count them.

A. 3.

In fact he puts his finger at random upon the pins and does not count them. We now have 3 single sous and 2 double, spread out on the table.

Q. Do you know how to count?

A. A little, not much.

Q. How many sous are there on the table?

A. (without counting) 3 sous.

Q. No, count them.

He does so, counting the double sous as single sous; furthermore in one case, he puts his finger between two pieces and counts only one sou.

A. Four sous.

We must add that no matter what problem we give him he always has a reply.

Q. From 19 apples we take away 6 apples; how many are left?

A. 7.

At another time he would say 9 or any other number. It is a very curious mental state. On being analyzed, it reveals itself as something very complex. In the first place Victor has learned a

certain number of things. He knows a series of figures and can recite them, though there are of course many errors in the series. What pains have been taken to teach them to him! What an amount of lost time! The reader can judge for himself. Oh, the beauty of teaching done at random!

The names of colors are as badly learned as those of pieces of money; light green is called white; dark red, blue or yellow; dark blue, black; green, red or chocolate; pink, white; brown, white; yellow, yellow. Scarcely any denomination is correct. We are certain that if we had tried again we should have received an entirely different series of names.

Here is how he names some of the cards. He says that he has played cards with his sister; it is difficult to believe.

<i>Cards shown</i>	<i>Replies</i>
King of Spades	Spades—Hearts—a club
Ace of Spades	The diamond
Queen of hearts	Queen
Ten of diamonds	A heart
Seven of Spades	Spades
Queen of Clubs	A Queen

Invited to sort the cards according to design and color, he slowly succeeds in grouping together the cards of the same color; it is even necessary to encourage him, because left to himself he loses all idea of direction. It takes him 2 minutes, whereas a normal person does the same work, the sorting of 32 cards, with fewer errors in 35 seconds.

After all these failures it is very probable that Victor knows neither how to read nor to write. Since he does not even attain to the intelligence of a high grade imbecile, it cannot be expected that he could do what pertains to the level of a moron. We should not persist, for this would be very useless, if this question of reading and writing were not the occasion of some instructive remarks. We ask him,

Q. Do you know how to read?

A. Not much.

We hand him a newspaper begging him to read something. He accepts it, takes on a serious expression, and following the text with his finger, recites letters which have no connection with the printed characters. It is not even spelling. He only recites

what he remembers of the alphabet, a, b, d, v, r, p, c, q, r, etc. So he does not know how to read. This is enough to establish the diagnosis of Victor.

✓ Let us make a résumé of our tests. Victor is defective in intelligence; this is the incontestable result of our examination. Let us now be more precise. He is not an idiot, since he understands verbal orders. He is not a moron, since he can neither read nor write. He is an imbecile. Since he is capable of naming certain objects, of comparing two lines and two weights, he is an imbecile of the middle grade; on the other hand, not being able to name the colors, nor the pieces of money, nor to execute three commissions given him simultaneoulsy he cannot belong to the highest grade of imbecility; he stops at the middle grade.

It remains now, after these preliminaries, to study his language.

The verbal data upon which we are going to work are notes taken at the very moment that he spoke; in these notes we have expressed verbatim what we believed he said, without changing anything; in the rare cases when we did not understand one of the sentences we have passed it by in silence.

[The process by which one gathers the words of an individual should be noted in a linguistic study, because it exercises a certain influence upon the language of the person studied. The best process would be without doubt to remain listener, and to write the words as they are spontaneously spoken. But the imbecile is one of those who have no story to tell, and who willingly remain silent.] Generally Victor asks no questions, nor does he take the initiative in a conversation. To induce him to talk one must question him; this is what we did. [We have therefore studied only the language of his replies; and this language is always more or less influenced by our questions; the idea always and very often the words, even the grammatical forms, were the result of our suggestion.] These conditions understood, we present our observations upon Victor.

According to a plan which was suggested to us by M. Meillet, professor at the *Collège de France*, an individual linguistic study should contain vocabulary, phonetics, and grammar. We set aside phonetics because Victor presents nothing peculiar in the articulation of his words; his articulation is normal, as is also the rapidity of his speech. It remains therefore simply to study his vocabulary and grammar.

As to vocabulary, we shall not dwell at length upon this as it presents nothing that is especially interesting. Victor employs current concrete words, and practically no abstract words. He does not misform them like a child or an aphasic; he does not say "dada" for a horse, nor repeat a syllable to form words of an infantile language. He does not use to excess words like "thing" (*machin*), he uses no circumlocution, and does not make himself conspicuous by the impropriety of terms, that is to say by a development of language that is out of keeping with his intellectual level. [We have rather the impression that his vocabulary is extensive; in a catalog of hardware he names correctly a host of household utensils. We are of the opinion—though this is only a hypothesis—that his vocabulary is superior to his grammar. We understand by this, that if his vocabulary represents the linguistic development of a child of a certain number of years, his grammar would correspond to that of a younger child.] Note also that he invents no neologisms.

His grammar is more interesting because it bears more strongly the mark of his intellectual deficiency. In the first place let us note that he speaks little; his sentences are short, he willingly abridges or suppresses many words, as though the spoken language were repugnant to him.] More often to very many questions he contents himself by replying, "Yes, sir," "No, sir;" his favorite reply is the very prudent expression, "Not much" (*pas beaucoup*). [It has even seemed to us that Victor has less relish for speech than he has verbal capacity, and that often he could speak at greater length than he does;] because, called upon to express the same idea under different circumstances, he expresses it sometimes in two words, sometimes in a more extended sentence where the same two words appear with other words.

We shall study this more in detail.

Length and nature of the sentences. His sentences are always short, as we have said. They have 3 words, or 5 or at times 7. The maximum that we have observed is 9 words in the following sentence, "*The school master keeps you in*" (*Le maître d'école il vous fout en retenue*). The proposition is simple, there are no subordinate clauses. [In order to explain a complicated action which he has seen performed before him, Victor proceeds by little sentences; he will say, for example, "He took some pins—and then he has——" Even when he reproduces something told him,

he returns to his system of little propositions, detached one from the other, or simply attached by "and then." One day we told him the story of a little girl who, during the absence of her mother, let her racquet fall in the well and was drowned in attempting to regain her plaything. He reproduced the story in the following manner, "The woman is away—to do errands—the girl played with her racquet—the racquet fell in the well—the little girl also—goes to get it."

Persons. He employs all the persons of the verb, and also all the personal pronouns. Speaking of himself he says, *I*. For example, one is interesting him in drawing and asks him to draw a dog; he replies, "*I* don't know how to draw dogs." He says *thou*. Speaking to one of us, who had just been tormenting him by all sorts of tests, he assumed this familiar manner in addressing us, "*Toi, tu es ficelle.*" He says *he* or *she*; speaking of his sister, he says, "She washes, she darns," but more willingly, "*a* darns the socks;" sometimes even there is entire suppression of the pronoun, "does errands, sews on the machine," for "*she* does errands" etc. *You* figures in this sentence. "You want to make me angry" (*Vous voulez me monter le cou*). Often he uses the pronoun *one*, which belongs to the Parisian idiom, for example, "One is bored" (*on s'ennuie*). Lastly he has a tendency to leave the pronoun *I* understood and even the auxiliary; notice the following sentence. We ask him, "What have you done this morning?" A. Brought the soup. Q. And then afterwards what else have you done? A. Been to get bread. He suppresses in these cases, *I have* brought, *I have* been, etc. Also here, boasting of his skill in bottling wine, he says, "Never broken any bottles, I, monsieur;" instead of "*I have* never," etc.

Tenses. [The verb is used in either the present or the past; we find some examples of the perfect. Thus having perceived one of us pretending to take pins out of the bowl on the sly, Victor denounces him by saying, "He has taken some pins." Another time, reproducing a story he said, "The coachman has crushed a man."] We could even cite some examples of the imperfect of the indicative, but only in cases where it had been suggested by a question in the imperfect. Q. What did your sister do? A. She worked. We have never encountered the future. The only way in which he ever speaks of an event in the future is by putting it in the present, "My sister comes tomorrow, Sunday."

Articles. Definite and indefinite articles are employed correctly; only he often leaves them understood, "Policeman has arrested a man," for "the policeman, etc."

Agreement. The agreement of a noun with its adjective is made correctly. "He is *nice*, my chief" (*Il est gentil, mon chef*).

To be definite, we do not find it necessary in Victor's case to make any special remark upon vocabulary or phonetics. The only peculiarity worthy of note concerns the assemblage of words. There is nothing incorrect in that assemblage, but it tends toward conciseness and simplicity by the reduction of the words in a sentence and by the frequent suppression of words, usually those that commence the sentence, and lastly by never employing subordinate propositions, which is a characteristic to be noted; and this seems to prove that it is more difficult to form these propositions mentally, than to conjugate the verbs or to correctly employ the articles and pronouns or to make the adjectives agree with the substantives.]

[Briefly, the characteristic feature of this syntax seems to us to be atrophy. It is in harmony with the mental state of this imbecile, which is especially a state of poverty.*]

* There is a point which we have not treated in the text, from lack of sufficient data; it is in relation to a very interesting question about which we have only our suspicions. It has been seen that we can give to each defective the age of a normal child, for example we can say of a certain imbecile of thirty that he has the development of a child of five. This comparison is never altogether correct in that which concerns language. The defective appears to us to have a language development superior to the normal. Here is a curious proof. One of us charged one of our pupils, Mlle. Hoffman, to study the association of ideas with school children. It turned out that children of seven years scarcely found as words to associate any but those of the same sound, of the type of these; the word given is *chapeau* (hat) the child repeats *chapeau* or says *peau* (skin) or *chat* (cat), etc. . . . On the contrary, middle grade imbeciles of the type of Victor, who is certainly not at the level of seven years, can find associations of other words, by relation of significance; to *chapeau* they reply for instance by the word *tête* (head). It is evident that from the point of view of verbal ideation, this is a higher level. We note this fact in passing, counting upon returning to it later after having studied it more deeply.]

X. THE RELATION BETWEEN THOUGHT AND LANGUAGE

There is no problem more discussed than this. It is only candidates for the bachelor's degree who are able to discuss the matter with ease. Those who have reflected a little are not slow in finding that the problem is very complex. But there is some chance of solving it, if, instead of taking it in its entirety, we divide it into parts.

Experiments upon the mechanism of thought, undertaken and published by one of us five or six years ago¹⁰ which have been taken up and developed of late years in Germany, especially by Kulpe and his pupils,¹¹ have shown, as a first point, the necessity of making a distinction between the thought and the image; to think can not be reduced simply to recalling an image, because one must also comprehend the image, that is to say one must realize what it is meant to represent as though it were a picture. The proof of this is to be found in experimental facts which are particularly striking. When with minute care one questions a person upon what he has just thought and upon what he has just imaged, one notices that from his description there is a disagreement, almost a contradiction, between the thought and the image; it happens, in fact, that one thinks one thing and represents to oneself another. More often, and one might even say always, the thought is richer than the images; one pictures to oneself a part while one thinks the whole. Example: one has the idea of an excursion planned for the morrow, but one does not represent to oneself either the excursion or "tomorrow;" one visualizes only the surroundings, for instance the mountainous district that one is going to visit. William James held these ideas; but he held them theoretically; the best deduced of these reasonings, and even his too theoretic examples, have not the eloquence of the

¹⁰ See *l'Étude expérimentale de l'intelligence*, by Binet, Paris, Schleicher Bros.

¹¹ See *Revue générale sur l'intelligence*, by Larguier des Bancels, *l'Année psychologique*, XIII, p. 476.

introspections gathered from persons who have no theory and who do not reason. It results from all this, that the thought and the image are two and that there can exist a *thought without an image*.

In what then does thought consist? If it is something other than the total of our representations, of what elements is it composed? Certain critics of our earlier work have objected to the idea that a thought can exist without sensorial elements; they have suggested that what is lacking in the image, which is always individual, narrow and paltry, to enable it to keep pace with the unfolding of the thought, can be supplied by the word. The thought would thus be at the same time image and inner language, a combination of both, and what is not image would be speech, and what is not speech would be image. Let us remark before going farther that this explanation is not entirely satisfactory because one can object at once that language is but a substitute and has only the value of a symbol, a factitious value. A word in reality signifies nothing in itself, it is less expressive than an image, it is only an inert brute element, like the noise of the wind or the sound of a hammer, and consequently has more need than the image of being completed by some other thing which represents its signification. On the whole the debate comes back to this; to make it clear let us represent a thought by pieces of money; the thought corresponds, let us say, to 100 francs. But the image is not worth 100 francs, it is worth only 20 or 30 sous; but the word is not money at all, it is only a substitute for money; the word is like commercial paper, a bank note, which is the sign of a gold reserve. But where is this reserve? In what does it consist?

If we attack this problem by the way of experimentation, this is exactly the question to which it is necessary to reply; like the image the word corresponds only to a fragment of the thought; to translate the thought in its entirety into words would require a long discourse. Thus one asks a person if she has read a certain book, and she replies, "*No*." This negation, to which she limits herself, does not correspond to her complex thought, because that *no* is a general negation, consequently very vague; while the person makes a negation of an extraordinary precision, specialized to a certain question and regarding a certain book. Thus, evidently, the thought surpasses the word. Let us suppose if the thought surpasses the word spoken, it is possible that it does not

surpass the word thought; it is possible that our interlocutor limits herself to pronouncing this little word *no*, but has an inner language very much richer. One can imagine that she pronounced mentally or heard mentally the entire sentence, "No, I have not read the book about which you speak;" and if this supposition seems too opposed to the personal feeling which we have of not making such a use of the inner language when the thing is not worth the trouble, one would still say that the above sentence was repeated in a shortened form, murmured, whispered, or in a word that it might have been in our consciousness like a large panorama which one takes in with a glance of the eye rapid as the lightning. Is this supposition correct?

This is a difficult question to answer when we take for subjects those whose inner language is already well developed. These persons may protest as much as they like, affirm that they do not represent to themselves in any possible manner entire sentences which would be necessary for an adequate expression of their thought, but the fact still remains doubtful; because being capable of this verbal development one may suppose that they are not conscious of it, that they have performed the operation unconsciously. All this doubt is cleared away by the examination of imbeciles and also of aphasics.

We have already recounted that Denise one day had a ring on her finger, which she turned and re-turned with satisfaction. We asked her, "Who gave you that pretty ring?" Without hesitation she replied, "Mama." Let us weigh this word. Let us note that in order for the thought contained in this reply to be completely developed in language, it would be necessary that Denise had replied to us or had simply thought to herself the following sentence, "It was mama who gave me this ring." But she cannot articulate even mentally this sentence, which is very evident, since her vocabulary is reduced to five or six words and her mental level does not permit her to make sentences. We are therefore very certain that, in this case, her thought has no corresponding series of necessary words; it is indeed a thought without sufficient words and consequently there is in her a thought without words.

We find analogous examples furnished by aphasics. The watch-maker, observations of whom we have previously reported, when we suggest to him a complicated act like counting aloud 20 sous

in 1-sou pieces, remains a moment reflecting upon the money spread out before him upon the table and then says to us with profound conviction, emphasizing each word, "*Ça, non!*" ("That, no") which signifies: "I feel myself incapable of doing what you ask." This last sentence our aphasic evidently could not pronounce, since his language also is reduced to a few words, and since he can no longer construct sentences. But the argument furnished by this observation is perhaps less convincing than that which is furnished by our imbecile; one can always suppose than an aphasic who has previously spoken has retained a better inner language than his actual articulated language, and that what he does not say with his phonetic organs he can say to himself mentally.

Let us therefore return to our imbecile; with her we are at least certain that there exists no interior language sufficiently complicated to give place to sentences. Let us cite a second observation of her. She is very modest, almost laughably so, and we apologize for presuming upon it; but a psychologist has the right, to take his material wherever he finds it. Often during our conference she has interrupted her bursts of laughter by taking on a serious air and coming close to us to say under her breath, "*pipi!*" which signified in a sentence, "I wish to *pipi*; conduct me to the toilet or else let me go alone." But here we hold the irrefutable proof, as we believe, that language is not coextensive with thought. It is absolutely certain that Denise is not able to conceive mentally of this sentence nor of any other sentence as slightly complex as one can imagine but capable of expressing the same thought. The proof which comes from this observation is excellent, very much superior to that furnished by the word "Mama." In replying this word Denise has heard and understood the sentence by which we asked the question, and if she is incapable of forming a sentence herself, one might suppose as a last resource that she had retained our sentence which she heard, and that it was the memory of this sentence which constituted the verbal part of her thought. Here the objection can find no place, because Denise heard no sentence; she is not replying, she said the word *pipi* spontaneously, which thus finds itself in a place to solve one of the highest problems of the psychology of thought.

Very many other analogous observations might be cited. Among our low grade imbeciles there is a young man of twenty-five, with

regular features, who also understands complex sentences but has a vocabulary reduced to some ten words. One day when we wished him to write, he refused to take the pen, and touching his right hand with his left hand, repeated several times in a voice expressive of pain the word, "Bad! Bad! Bad!" Evidently he wished to say, as all his gestures of refusal and of suffering clearly indicated, that his right hand hurt him and that it was this which prevented him from taking the pen. This makes still another case where one could not make a hypothesis of the existence of inner language which would be richer than the word effectively pronounced.

Still another objection. It will be said to us, "Your reasoning contains an error; it consists in regarding turn by turn the image and the word, apropos of different examples. You commence by remarking, apropos of the image, it does not represent all the thought. But it will be further said it remains possible that, if words and image are insufficient taken separately, they suffice when they are taken together, and the lack in the image is supplied by the word and *vice versa*. It remains possible to continue the objection that if Denise does not find in her inner language, evidently very rudimentary, anything to think with, she manages to think by images and nothing prevents us from supposing that an imbecile visualizes very much more than a normal person.

Evidently this is possible; it is probable that we shall never know to what point this is true because of the impossibility there will always be of demanding introspection of an imbecile of the grade of Denise. But our opinion is that images scarcely serve to do more than to represent material objects, the things perceptible to the senses; acts picture themselves imperfectly to the eye of the mind; still more is this true for the conditions, the projects, the relations of time and space, in a word, for all kinds of associations. The "I wish to pipi" or the "I cannot write because my finger is bad," cannot be expressed in images; they are thoughts of relations which can only express themselves in words; and if the words do not suffice, as in the present case, it is not the image which supplements their absence.¹²

¹² Since we are here treating a question of general psychology, we seize the opportunity to add that one of us (Binet), in experiments still unpublished, has succeeded in creating among adults a state where the inner language is suspended, and where the subject can still think, but rudimentarily. This artificial state, difficult enough to obtain and especially

All this comes back then to the conclusion that the thought is distinct both from the image and from the word, that it is quite another thing, that it constitutes a different element. But in what does this element consist? We suppose that it has the nature of feeling. This would be an intellectual feeling, consequently very vague in its nature but one whose presence and especially whose effects we perceive; and it is indeed by its effects that it is revealed to us, because the thought is not at all a state; it is an action, not a gesture; one sees the consequence of the gesture very much more than the gesture itself. American psychologists have understood this when they established their antithesis between the psychology of *structure* and the psychology of *function*; the first is especially descriptive, it recounts the state of that which is; the second has especially the point of view of the action; it places the accent upon that which serves, upon that which is useful, upon that which is accomplished. It is the confused and often emotional perception of that which prepares and accomplishes itself in us, which constitutes the thought. This vague sentiment becomes more precise when it produces images, words and acts; the representations, the inner language, and the acts, are the conscious forms of the thought; they are like the light, they render the thought visible to us; they reveal to us the detail as the touches of color placed upon the canvas reveal to us the gestures of an artist whom we watch at work while standing behind him. But they come only after the thought, they are its result; before imagining the thought, before speaking it, it is comprehended, it is performed. It is this feeling that dictates the words, and suggests the images; and in their turn, images and words react upon the feeling, amplify it, render it precise or modify it by a reciprocal work where the cause becomes the effect, and the effect becomes cause.

to prolong, is produced by a constant exercise of whistling or sustaining a sound, or of continually repeating the same word. If, to a person who conscientiously applies himself to this work of phonation, one puts a question in abstract terms, which requires of him some reflection, judgment, an act of approbation or of disapprobation, the person may arrive at judging with exactitude and of having the sentiment of approval or disapproval, although no single word of the inner language is at his service. Unfortunately these experiments cannot often be repeated, because after several attempts the subject succeeds in adapting himself, and he returns to his inner language, even while his mouth whistles or pronounces words; it is especially in the initial period that the experiment is profitable.

We think it very probable that this initial intellectual feeling, which precedes images and words and from which the images and words seem to come like a natural emanation, plays an important rôle in the realization which we have of our thought. In a word it gives us a foretaste of our thought, it permits us to perceive it before it is defined.

It is probably for this reason that our thought seems to belong to us, and that our images and our words are attributed to our personality and not judged as elements that have come from without, which would be strangers to us. There are very many mental states in which our sensorial and verbal representations are despoiled of this particular virtue of incorporating themselves with our person; indeed in some *idées fixes*, some obsessions, the subject feels himself taken possession of by something which is other than himself; and it is probable that a good part of the externalization of the hallucinations depend upon this character. There is room here to investigate whether certain psychic states in alienation could not be explained by a loss of this intellectual feeling which prepares the representative phase of the thought.¹³

In any case, we believe we have proved beyond doubt by our precise observations that there is a thought without images, that there is a thought without words,¹ and that the thought is formed by means of an intellectual feeling. These are facts altogether simple, elementary, demonstrable, which will serve later as foundations for new experiments and theories upon thought.

ALFRED BINET AND TH. SIMON.

¹³ It goes without saying that our thesis is contradictory to that of M. Janet who has supposed that the attributing of one of our states to our personality is made by means of what he calls "*a personal perception*;" that is to say, if we understand him rightly, a judgment of attribution which is essentially intellectual in nature. Already a penetrating critic, M. Maigre, had remarked that this personal perception is an operation of which we have absolutely no consciousness; it is therefore an hypothesis which one must present with a certain discretion and not as a fact of observation. If not M. Janet, at least his pupils have too often spoken of the personal perception as though it were a fact. We prefer to confide the same rôle to another process, the *intellectual feeling*, whose existence at least is not contestable after all the observations and experiments which we have reported, and it seems to us more natural to suppose that this fundamental rôle of incorporation of a state into the personality is held by a sentiment, than to cause the intervention of an act of judgment. At least the opinion of M. Janet will be interesting to have.

PART III
Feeble-Mindedness and Dementia

I. THE INTELLECTUAL WEAKENING IN GENERAL PARALYSIS

1. **CRITICISM OF CURRENT DEFINITIONS OF DEMENTIA.** Does there exist a clear and precise conception of dementia? Certainly not. The best definition given until very recently is the following: dementia consists in a definite, progressive weakening of the intellectual faculties following a state of normal intelligence. Let us note that this definition contains two distinct elements, the one evolutionary, the other static. Let us take the evolutionary character; this is doubtless very important for diagnosis, since from the time of Esquirol it has distinguished dementia from idiocy and similar states; but this is only a historical character, from which one could not draw any idea of the real import of the dementia at the moment of observation. The second element of the definition, the intellectual weakening, is still more unsatisfactory because it offers nothing that is really characteristic if we adhere to so vague a formula. What is this intellectual weakening of which we speak? In what does it consist? In what particular does it differ from the state of the intellectual faculties found among so many of the insane who are not demented? Intellectual weakening is almost the rule among the insane. Let us take melancholics; it is a very commonplace observation that these patients are less intelligent and, as it were, weakened in intelligence during their affliction, as compared with their state when cured. As to alcoholics, Kraepelin speaks repeatedly of their weakening intellectually. Chronic delirium cases, according to some alienists, present an attendant state of mental debility though this is perhaps questionable. Let us set these cases aside along with certain degenerates; it seems that all other insane cases without exception have a weakened intelligence. Certain ones are perhaps so only temporarily, and constitute what was once called acute curable dementia; but in any case, during the period of the existence of the disease, this weakened condition is evident, often demonstrable and even measurable. The distinctive criterion

which one seeks in this succession of ideas has therefore not yet been found.

If no clear conception of dementia exists in the writings of the older alienists, may we not at least find it among moderns, who for several years past have prided themselves on employing in psychiatry the language of psychology? Not among them either. For to say as some do, that paralytic dementia is a lack of *mental synthesis* is to be satisfied with words in order to follow the fashion, for this term mental synthesis is used to-day, rightly or wrongly, apropos of everything, and consequently does not apply any more exactly to demented than to other insane patients. To see in paralytic dementia an *incoherence of the association of ideas*, as Mas-selon has lately proposed (see Intellectual Weakening, *l'Année Psychologique*, XIII, p. 260) is to attempt a psychological explanation which, though more precise than the preceding, is only the more criticisable, because the ideational phenomenon of incoherence is to be found among many other mental patients. Since it is very much less accentuated among general paralytics than among many maniacal, hallucinational, and confusional states, it cannot therefore characterize dementia. The great, the serious fault of these so called psychological definitions is that they are so commonplace; far from being applicable to dementia alone they would answer equally well for nearly all forms of insanity.

Whence does it come then that, notwithstanding the inadequacy of this theory, practitioners have the merited reputation of making an early diagnosis of general paralysis with the greatest accuracy? It is, first, because they make use of signs, especially of certain physical signs which ordinarily accompany dementia. For instance, if an individual has a pupillary inequality, especially if he has difficulty of speech, and if to this difficulty be added the poorly defined symptom, intellectual weakening, then the diagnostician hesitates no longer; it is paralytic dementia; the practitioner leaves to the psychologist the delicate and unnecessary work of analyzing the intellectual weakening of the demented. In addition to the physical signs, and even when these are lacking, the practitioner makes use of certain information furnished by the family concerning the conduct of the patient; this information is characteristic; it bears upon facts which are stamped in advance as symptoms of dementia. The neglect of his affairs, the lack of care and neatness,

forgetting his address, the impossibility of performing a complicated errand, errors in making change, heedless extravagance, are the facts which the practitioner recalls under the form of striking incidents; if he finds these or other similar incidents in the life of his patient he hesitates no longer, nor does he further scrutinize the mentality of the patient. More than this, persons of the highest authority who have written upon the intellectual symptoms of paralytic dementia have done no more than recall such a series of incidents while summarily classifying them under the heads of disorders of memory, of attention, of will; they believe they are writing psychology and characterizing a mental state.

It is true that this empiricism usually suffices for the needs of medical practice. But it does not always suffice. We recall that once we were asked to diagnose the case of a woman some fifty years of age who had the small head of an imbecile. Her clothing was dirty and in disorder, she balanced herself on her chair and had spasmodic mumbling. She gave slow, monosyllabic answers to our questions and did not seem to understand the greater part of them especially the difficult ones; she gave indeed the impression of a diminished intelligence, but was she an imbecile or a paralytic? She had no pupillary inequality and spoke too little to show derangement of speech. The first physician saw in her an imbecile; as for us, allowing ourselves to be guided by one of those almost indefinable impressions which are so frequent in mental pathology, we inclined toward general paralysis. At this moment we are well convinced that only by the study of the mentality would it be possible to decide, and to recognize dementia one must know what it is from the psychological point of view.

But the most serious objection that one can make against the empiricism of practitioners is that if empiricism does suffice to make with surety the greater part of the daily diagnosis it does not go beyond diagnosis; this is practice but not science, that is to say particular not general; and, moreover, practice being thus separated from theory remains local, partial, commonplace and does not benefit by more extensive studies; this is very much to be regretted because there is reason to suppose that the different forms of insanity show relations and resemblances among themselves and the analysis of one would greatly illuminate the others.

It is under the influence of these ideas that we have undertaken

our investigations. We have studied the two principal forms of dementia, senile and paralytic, especially the latter, endeavoring to find the psychological formula which applies to it and to it alone, because this is the necessary condition of every demonstration. How we went about it will be seen from what follows. It is unnecessary to explain our method; the best way is to see it in action. We have seen, examined and submitted to every sort of experimentation some forty patients. It is many, even too many; we have accumulated so much material only because the idea which was to come out of it and permit us to interpret it all was long in making itself known and we have been able to see clearly only after long groping in the dark.

We begin by the study of general paralysis, or paralytic dementia.¹

2. THE LOWERING OF THE INTELLECTUAL LEVEL IN PARALYTIC DEMENTIA. We are going to show that every dement has an intellectual level below normal. This statement needs explanation because it would seem that we are, as it were, breaking down a door which is not locked, and it will be thought useless to demonstrate what everybody knows; namely, that dementia carries with it an intellectual weakening. But we lay aside this expression intellectual weakening, which is vague and equivocal and which we shall reserve for criticism farther on. We wish to show especially that if our measuring scale of intelligence were used, which is composed of a graded series of slight difficulties to be overcome, of little problems to be solved, it would be easy to determine the point in this series where the dement fails; and as each point of the scale corresponds to a level of normal age established as a result of experiments upon normal children, this procedure permits the determination of the mental age of a general paralytic, by saying for instance that he is at the level of eight years or of five years. We have here a measure whose pre-

¹ The present study is, in a certain measure, complete in itself; but, from the point of view of the directing idea and of the method, it is closely connected with our four preceding studies upon alienation the conclusions of which it continues. See in *L'Année Psychologique*, XIII, p. 163, and following, our three articles on sub-normals; XIV, p. 1, our article already cited upon the Development of the Intelligence among Children; XIV, p. 284, the article upon Language and Thought; and finally in the present volume, the article upon The Intelligence of Imbeciles.

cision is interesting, and quite preferable to that commonplace assertion that a certain patient is very weak mentally and that another is not so weak. We have taken the level of intelligence of a great number of demented and here is what we have noted.

Although the method was organized for children and imbeciles only, the great majority of demented lend themselves admirably to it for two reasons. In the first place this is because of their confident, happy, optimistic character. They seat themselves quietly and reply to our questions without asking the why or wherefore of the examination even when we abruptly ask them such childish questions, as, "How many fingers have you?" At times a slight excitement or a touch of delirium troubles our examination, but it amounts to very little. Only once one of our patients, a bachelor of some forty years, on hearing our first question replied dryly, "Pardon, sir, I should like very much to know why you ask me that." Let us recognize this as the reply of one who is annoyed rather than of a paralytic. If our paralytic was capable of it, it was only because he was at the beginning of his affliction and his mental level was twelve years and consequently nearly normal. This is truly a case where the exception proves the rule.

The mental dispositions which render the general paralytic suited to an examination of intelligence are not the same as those which act upon imbeciles and morons. In a previous study we have described the attitude of docility and deference which very many defectives show us; their deference is such that they seem to obey the most absurd suggestions. General paralytics have a different character; if they yield to an examination it is not through deference. This social sentiment is no part of their psychology. They are particularly satisfied with themselves, without sequence in their ideas, and with a foundation of indifference, and this mental state renders them equally as manageable as imbeciles; let us add that irritability is encountered similarly in both.

Another reason why our general paralytics are excellent subjects for experimentation is because their particular form of mental trouble can readily be caught by the tests. What we here affirm needs explanation. Let us attempt to give the tests to a patient suffering from delusions of persecution. First he may resist, grow angry, or refuse to speak. Let us suppose him to be tractable. In spite of this his mental state will not be discovered by

our tests because, while his delusions prove an absence of judgment, it is rare that our special tests upon judgment show that faculty to be lacking in him. It would seem that his intelligence is divided into two parts, the one sane and the other delirious; it is only the sane part that the experimenter can put into action by the tests. On the contrary, with the paralytic everything is affected, the weakening is universal, and he shows himself as much at fault for any question of our examination as for the circumstances of his life.

Another remark. Our method permits of measuring the intellectual level without taking account of accompanying circumstances which sometimes produce an illusion in regard to the intelligence of a person. Thus, we have examined a patient whose difficulties of articulation were so accentuated that we had much trouble to understand him. To listen to him one would have thought him of very low grade; on measuring his intelligence we found that he had a level of nine years. Psychic and physical troubles do not always go together although one is certainly inclined to that impression; do we not find emphasized in treatises a form of paralysis in which physical troubles are particularly marked? That which was evident only in very marked cases no longer appears as an exception.

It might be objected that an extremely precise measurement of the mental level of general paralytics is of little value except for the moment it is made, since they are constantly on the road to dissolution. Consequently this measurement has not the same interest as in the case of an imbecile whose level is very much more static. But there are a number of problems which remain since the discovery of paralysis, which we have not been able to solve through lack of method by which we can appreciate the degree of dementia; for instance, is paralytic dementia progressive or does it proceed by sudden drops? Would not the prognosis of its evolution be different if six months of the affliction sufficed to reduce an average intelligence to a level of five years while in another case two years of illness have not resulted in a similar decay? Since Baillarger there has been much discussion upon the degree of retrogression, upon its reality, whether it extends only to physical troubles and the phenomena of delirium, leaving the other functions definitely injured, or if paralytic de-

mentia, properly so-called, although attributed by the anatomopathologists to the destruction of the fibers of Tuczec, is nevertheless itself subject to retrogression. The intellectual level of the same patient carefully taken at different dates would quickly enlighten us upon these points.

In conclusion we shall cite as an example the measurement of the level of a woman reduced by dementia to the intelligence of a child of five years.

Beauchamp is a woman of thirty, with delicate features and an amiable, smiling expression. She was formerly a teacher. Her husband who esteemed and admired her tells us that she had a very cultivated mind and a taste for art and literature. Now at the end of only six months of illness she shows a lamentable degree of decay as we shall demonstrate. She talks willingly although chiefly in monologue. Certain days she continually repeats the same story but her recital is so obscure, so incoherent, so weak that we cannot understand it even after many repetitions. She talks about a little child, very small, and we conjecture that the mother of Beauchamp says to the child, "Oh, how dirty you are!" Then the child seems to have thrown something violently to the floor, "That went pout!" The patient mimics the scene with energy. Soon after she looks at us and shows us the palm of her right hand where there is a little scar which moves her to pity. She ends by explaining that the apothecary had been consulted. And that is all. As soon as the story is ended the patient begins again. We have not been able to discover whether that little child was Beauchamp herself or not.

She lent herself willingly to the experiment as far as her intelligence and power of attention permitted. In reality she could not comprehend the simplest tests and the explanation which we gave her served practically no purpose at all. Below we give our conversation with a table showing the tests passed. We call attention to the fact that the sign + indicates that the test has been passably well executed while — is the sign of failure.

*Measuring Scale of Intelligence. Results Obtained with Beauchamp,
General Paralytic*

TESTS	RE- PLIES	TESTS	RE- PLIES
3 years		6 years	
Show nose, eyes, mouth.....	+	Show right hand, left ear....	+
Enumerate a picture.....	?	Repeat sentence of 16 syllables.....	-
Repeat 2 figures.....	+	Make aesthetic comparison..	-
Repeat a sentence of 6 syllables.....	+	Define by use.....	-
Give family name.....	+	Do 3 errands.....	-
		Tell age.....	-
4 years		Distinguish morning and evening.....	-
Give sex.....	+		
Name key, knife, sou.....	+	7 years	
Repeat 3 figures.....	-	Distinguish lack in figures...	-
Compare 2 lines.....	+	Give number of fingers.....	+
		Copy a written sentence.....	-
5 years		Copy a diamond.....	-
Compare 2 weights.....	-	Repeat five figures.....	-
Copy a square.....	-	Describe a picture.....	-
Repeat a sentence of 10 syllables.....	-	Count 13 single sous.....	-
Count 4 single sous.....	+	Name 4 pieces of money....	-
"Game of patience" with two pieces.....	-		
		8 years	
		Reading with 2 memories..	-
		Count 3 single and 3 double sous.....	+
		Name 4 colors.....	+
		Count from 20 to 0.....	-
		Compare two objects from memory.....	-
		Write from dictation.....	-

Q. Point to your nose.

A. It is in the water! (Incomprehensible sentence but she points to her nose as she says it.)

Q. Point to your eyes.

A. Here they are! (She leaves her chair and comes close to us with the intention of showing her eyes.)

Q. Where is your mouth?

A. There it is! (She opens her mouth and places her finger there.)

We see that the first test is passed and proceed to the second

We place before the patient a picture representing an old man and a child drawing a cart.

Q. Look at this. Do you see? Tell me what we have here?

A. Oh! I do not know.

Q. Look at it closely!—

A. Oh! I don't know—I do not know. (She seems ready to pout.)

Q. Oh yes? Tell us what you see?

A. I see nothing.

Q. Isn't there a picture?

A. No,—Oh! it is a little old man—and then the other—(turning herself towards us) and then you see—

Q. And besides?

A. (Putting the picture aside and handing it back to us) I do not know who it is. I do not know who it is.

Q. Well, this one? What do you see in this? (Showing her a picture of two unfortunates upon a bench.)

A. Oh! It is an old man asleep.

Q. And besides?

A. That is all—and his wife is beside him. (She pushes the picture away as though she did not wish to be bothered.) Oh! I do not know her.

Q. And this one? (We show her a picture that represents a prisoner looking out of the window of his cell.)

A. Oh! I don't know—

Q. But tell me! Look! What do you see?

A. Who is it? Oh! I don't know who it is.

Q. But what is he doing, this poor man?

A. Oh! I don't know. I don't know him.

As we insist she seems to be irritated, pushes the picture away and pouts while replying "I don't know."

Q. Let's laugh a little.

She smiles. Her calm has returned and we can continue.

We consider that she has passed this second test because for two of the pictures she has enumerated, "It is a little old man and then the other." Once even she gave a bit of description, "It is an old man asleep." But it must be remarked that it required great effort for her to adapt herself to the experiment; it was necessary to insist before she could be induced to look at the pictures; she even thought that we were asking her to recognize the persons in the pictures, a very curious absurdity which a normal child would never commit.

The third test is a repetition of figures.

Q. Listen now carefully. I am going to explain what we are going to do. I am going to say some figures and then you will repeat them. Under-

stand! I am going to say a figure then you say it after me. Listen (we raise our voice) 4!

A. 4.

Q. 2, 9.

A. 2. Why should I do it?

Q. 6, 8.

A. 2, 4, 6, 8.

Q. 6, 1, 3.

A. No, I am not that old—I am thirty years old. (She adds some words which we could not catch. It is a confused murmuring.)

Q. 3, 2, 9.

A. (She repeats nothing.)

Q. 0, 2, 8.

A. 8, 2, 0. See?

Q. 1, 3, 9.

A. 9, 8.

It is evident that when we give her a single figure she understands that she must repeat it, but when we give her two or three she ceases to understand or loses the directing idea of the experiment after having had it for a moment. We note that once she was able to repeat two figures but never three.

The following test consists in giving words and sentences to be repeated. Our patient is going to act in this as in the other tests.

After a preliminary explanation we pronounce in a louder voice the words to be repeated.

Q. Papa.

A. Yes, my papa.

Q. Shoe, hat.

A. Yes, my hat. And then—I have a veil.

Q. (In a natural voice) But no, that is not it—You must repeat just what I say without adding any more. Now repeat what I say. (With raised voice) Hat! Shoe!

A. Yes, my hat—yes, it is blue—it is blue with some—etc.

The patient has not understood. To put her right we had recourse to a proceeding which has often proved successful with normal children; instead of explaining in abstract terms that one must repeat we have her repeat some very simple words, then we complicate them progressively; it is a sort of bait.

Q. Pampam!

A. Pampam!

Q. Papa!

A. Papa!

Q. Mama!

A. Mama!

Q. Dodo!

A. Dodo!

Q. Shoes, hat.

A. Yes, my shoes with mama.

Q. It is cold! I am hungry!

A. Yes, from that moment——(Prattle).

As it is a question here simply of recording a result we are obliged to admit that our patient did not satisfy the requirements of test four and that she does not repeat the sentence of six syllables. Perhaps she might do so after training but this would no longer be within the limits of the test.

Q. What is your name?

A. Margaret.

Q. And your other name?

A. Beauchamp.

This reply is completely satisfactory; it is true that this test has a social character and that in life one has occasion to say his name much oftener than to repeat one or two figures. Our scale is adapted to little children and they are often puzzled to remember their family name; they find it easier to repeat two figures.

To sum up, our dement passes all the tests at three years except one; she attains therefore the level of three years, following the rule which we have established;² but there is in her manner of answering the tests something which differentiates her from a child.

Let us pass to the tests of four years.

Q. Are you a gentleman or a lady?

A. Indeed, I am a lady.

The question is unusual, almost impertinent, but it did not in the least shock her.

Q. What is this? (Showing a key.)

A. It is my key.

Q. And this? What is this? (Showing a pen-knife.)

A. Very well, my little——It is a little thing for me——

Q. What do you call this little thing?

A. A little knife.

² See The Development of the Intelligence of Children, *L'Année Psychologique*, XIV, 1908. (Our Vol. 1, p. 182.)

Q. And this? (Showing a sou.)

A. Ah! that is two sous for me. (Smile.)

We admit that this test has given satisfactory results. The attitude of the patient is nevertheless very peculiar; in the first place she had difficulty in evoking the name of knife; then she constantly took an attitude of proprietor or rather of monopolist. "It is *my* key, it is two sous for *me*." We have never encountered anything analogous among normal children.

Q. Here are two lines. Which is the longer?

A. Well—there! (She shows the longer without hesitation.)

All the tests of four years are passed except the repetition of three figures. Let us see those of five years.

Q. Do you see these two boxes? (The boxes are placed before her on the table.) Give me the heavier.

A. I do not know which is heavier.

Q. No, but find out and give it to me.

A. (Showing a box.) Well, that one?

Q. Give me the heavier?

A. Well, there is none—also inside—Well, both of them.

Q. (Both boxes are placed in her hands.) Give me the heavier one.

A. Here it is (she gives a box), and then this is the other (she gives the other box).

The test is not passed; our dement did not understand the question.

Copying a square gives rise to many difficulties. A large square was drawn before her on a sheet of paper and she was asked to make one just like it. A pen was placed in her hands. She seemed very willing and said, "Very well, yes, there!" but she had not understood because under the square she slowly wrote her full name. We were obliged to intervene with a new explanation; then she began scribbling in the model; we stopped her and finally obtained a reproduction of the square but quite lacking in proportion. Nevertheless, the lack of skill in her hand which the design betrays is far less than her lack of skill in comprehending. If we compare her with a normal child of three or four years we see at once the difference. The normal child may be far more awkward in directing his hand and in drawing the figure, but on the contrary he is far more intelligent in comprehending that what is required of him is to copy it. Furthermore we find two other curious examples of this difference. We attempt to make

our patient copy a diamond and a written sentence. For the diamond she writes below it a little line in zigzag, which shows once more how little she understands what is desired of her. We make her a second model and urge her to copy it; instead of copying it she embellishes the model with little scribbles inside or with little strokes about the outline. There is the same failure in copying a written sentence. We had written "The Little" and we asked Beauchamp to copy these two words, which should have been all the easier for her in that she can still write a little; but here again she did not understand. Instead of copying she read the two words and understood their meaning; immediately her mind was turned in a direction quite other than we had wished. She said, "That is it, the little baby; there, see the little dear."

Q. Write what you see there.

A. Well, it is very little, because it is four years old—It is sweet, it is darling.

Conformable to her ideation, the patient writes after the model, "baby of four years;" the writing is tremulous but nevertheless legible. This continuation of a commenced sentence seems to be dictated by the obsessing memory to which we have already alluded of the little child who went *poum!* The analysis of these three failures in the act of copying is interesting. A normal child may fail in the operation of copying, but he understands that it is a question of copying; this comprehension is so simple that generally when one explains the tests, it is understood; on the contrary our patient can copy very well since she still knows how to write a little, but she cannot comprehend what is asked of her.

Four single sous are spread before her on the table. When we ask her to count them, she does so rapidly and declares that there are four sous. How did she understand that so easily? We think it is because counting sous is a social usage like giving one's name, while repeating and copying are operations which have no social usage and which one does not frequently perform in life; thus our patient understands very well when asked to count, while she does not understand when asked to copy. Apropos of the act of counting we shall give two other examples which are very interesting. We wish to discover whether our dement can count 13 single sous; she counts rapidly, but arrives at the number

12; this is not a bad error. The following is better. We give her 3 double sous and 3 single sous and without difficulty she announces that that makes 9 sous. Note carefully that this test belongs to eight years. If our dement succeeds in this it is, first, because counting is a usual act; and, second, it is because she profits by previous instruction.

To finish these tests of five years let us say that our patient does not reconstruct the figure in the "game of patience;" she ends by uniting the pieces at random.

She was able to accomplish some of the tests of six years; she showed the first time her right hand and left ear and she gave her age. But she failed almost constantly in the other tests; most of the time it was because she failed to comprehend what was desired of her. The ordinary explanation did not penetrate her intelligence. In support of this we cite a beautiful example. It is a question of definitions. Nothing seems more simple than to reply to the following questions, "What is a fork, a table, a chair, etc.," when one knows these objects. But Beauchamp was never able to grasp the idea of a definition. Let the reader judge.

Q. What is a fork?

A. Oh! I had one. I had beautiful ones.

Q. Yes, without doubt, but what is a fork?

A. I had beautiful ones.

Q. But what is a fork?

A. Well, it is like that. They are very beautiful.

Q. But explain to me. What is a fork?

A. I had one that was beautiful—I have two of them.

Q. And a table? What is a table?

A. Oh! I have a beautiful table.

Q. A table, what is that?

A. I have a beautiful table.

Q. And a chair, what is a chair?

A. Oh! I have a beautiful chair.

Q. But what is it?

A. Oh! they are pretty—I have large chairs—yes, they are pretty, very large.

Q. And a horse? What is that?

A. (Quickly) Oh—I have none—oh! I have none, certainly not a horse.

Q. But what is it?

A. Ah! there are plenty, everywhere.

Q. But what is a horse?

A. A horse? Ah! I do not know where it is.

Q. And a mama?

A. My mama——

Q. What is a mama?

A. Well, I do not know.

Q. Yes, but what is it, what is a mama?

A. Oh well, I have one at home, she is sixty-two years old, mama.

Q. And in two years, how old will she be?

A. Well, the poor mother, she will go away.

Thus in spite of persistent effort, we cannot make ourselves understood, notwithstanding that this patient knows very well a fork, a table, etc., and we believe could define them if she only understood that we are asking for a definition.

By applying the rules which we have adopted we fix the intellectual level of Beauchanp at five years; we mean by this not that she has exactly the mental state of a child of five years, because we have seen how much of a difference separates her from a normal child of five; but rather that she fails for one reason or another before the same difficulties as a normal child of five years. In establishing this level we do not take into account the ways and means but simply the results.

II. THE MINOR PSYCHOLOGICAL SIGNS OF GENERAL PARALYSIS

1. A DIRECTING HYPOTHESIS. One who relied solely upon the results of our measuring scale would not be able to grasp the mental differences which differentiate an imbecile from a general paralytic. Shall we conclude that these subjects have the same mentality? Evidently not. We must put our readers on their guard against this erroneous interpretation of the bearing of our measurements. The scale which we use is made up of a series of small, intellectual problems, and it is quite possible that two individuals may fail in the same problems without for that reason having similar mentalities; the practical consequence is that the efficacy of their mentality is the same; but the mentalities may be different.

Our scale resembles very much a measuring rod which, instead of measuring the height, measures the intelligence; but just as an ordinary measuring rod gives no information regarding the normality of the physical development and may indicate the same number of centimeters for a normal child and for an adult hunchback, so our scale of intelligence gives the actual level of intelligence without analyzing it and without informing us as to the type of mentality.

The problem which we set for ourselves is therefore still untouched. Thus far we have not succeeded in discovering how the state of dementia differs psychologically from the state of imbecility. Let us try to go farther.

A commonplace idea shall serve us as an entering wedge. "The dement," it has often been said, "is a rich person who has wasted his fortune, while an imbecile is one born poor and who remains poor all his life." If we examine this idea closely we see at once by a simple statement of the facts that these two types of individuals are in an entirely different psychological condition. That which is lacking in the imbecile is a certain development of the thought; his thought has not evolved; and all that we know,

all that we have previously learned of the precise nature of the evolution of the thought, serves to make us understand the condition in which it is found. Let us add that within the limits where his thought has evolved he acts regularly if not normally. On the contrary the general paralytic presents to us a thought which has previously evolved and which had even reached the extreme limits of its evolution. This thought had then up to a certain moment been complete, but now it is attacked by a particular modification which has made it decrease.

In exactly what does this decrease consist? It is at this point that our hypotheses commence. We believe that we have the choice between at least two explanations. According to the first, there would be produced in the paralytic a phenomenon the inverse of evolution. His intelligence would be like a train that reversed its engine and ran back over the same line in the opposite direction from the preceding trip. The general paralytic would thus find himself realizing successively by a sort of tumbling down the mental state corresponding to ten years, then nine years, eight years, seven years and so forth. This hypothesis of retrogression has for its one great merit that of clarity; but this is probably all that can be said for it, because when one looks closely at a general paralytic one sees clearly that his mental state does not resemble that of an imbecile, still less that of a child. Thus Beauchamp, whom we have already somewhat analysed and whom we placed at the level of a child of five years, knows better how to read, to write and to count money than a child of five years; and on the other hand she has some more serious lacks of comprehension than is encountered even among such young children. There are here a host of slight signs which make us decide to abandon the hypothesis of retrogression; and we boldly chose another which we are going to explain.

We admit provisionally that our patients remain virtually in possession of all their intelligence but that they have difficulty in making use of it; the injury would affect the functioning; there would be embarrassment, difficulty, slowness and often even impossibility of exercising the existing functions, of applying acquired knowledge, in a word of making the machine work. Even leaving our hypothesis in this very vague form we can already predict what its character will be; this difficulty of functioning presents in reality an essentially pathological stamp, and conse-

quently it would only be by chance, by a wholly exterior resemblance, that the paralytic could be compared to an imbecile and especially to a child. Therefore, while the hypothesis of retrogression would lead to the conclusion, certainly unacceptable to any one who has associated with general paralytics, that these subjects have the mentality of children, the hypothesis of the failure of functioning prevents any comparison of this nature; it allows us indeed to foresee that children, imbeciles and paralytics are alike in their inability to solve the same problems; they are stopped by the same obstacles so that we can attribute to them the same mental level; but the identity of the results in no way implies the identity of mechanisms; the mentalities remain distinct.

Let us try to give a precise meaning to the words *difficulty of functioning*. They are still vague, general, and we prefer to consider a single one of the phenomena in which this difficulty manifests itself. This phenomenon is of paramount importance and seems to give us the key to the problem. It is the evocation of the states of consciousness. We suppose, to state it briefly, that paralytics have especially a weakness of evocation.

2. ANALYSIS OF SOME OBSERVED RESULTS. We are now about to study successively the following phenomena, in which the aforesaid weakness of evocation manifests itself, and which therefore constitute from the practical point of view what we shall call *the minor psychological signs of general paralysis*.

Failure and slowness in the recall of certain memories.

Errors in naming colors.

Difficulty in the flow of words.

Lapsus calami.

Arithmetical errors.

Disorder.

Incomplete perceptions.

Illusions.

Inertia of comprehension.

Incongruous replies.

Greffage.³

These are only brief and precise laboratory notes. But they represent the results of tests and observations which we have

³ For definition of this term see p. 254.

ourselves made and which others will be able to repeat, verify and complete. We must of necessity commence by an understanding of the precise facts. Let us analyse each one a little.

FAILURES AND SLOWNESS IN THE RECALL OF CERTAIN MEMORIES. It is known that many of these patients cannot give their address, the number of their street, or the names of their friends. In such an instance authors readily attribute the trouble to a lack of memory in the patients; in fact proper names and figures are among the elements that are the most difficult to evoke; when one is fatigued one has difficulty in remembering proper names or in speaking a foreign language that he knows only slightly; this difficulty of evocation becomes very evident with the aged. It is the first break in the memory. Often one retains the faculty of voluntarily evoking all memories except that of proper names. Those who grow old at the head of a numerous staff know something of this.

We cite as an example a patient named Samse, a woman of forty-two years, who follows the occupation of stocking darning. She has a level of seven years; she is lively and pleasant and can give much exact information about herself and her family, her past life and her maladies; but whenever she is asked to give a precise figure she shows herself incapable. As to the time of her marriage:

Q. At what age were you married?

A. Oh! quite a while ago.

As to her belongings.

Q. Were you rich?

A. Oh well, I had a little money of course; it would be unfortunate to work and not have a sou. Do you think I would spend everything? No indeed, my money is invested.

Q. How much have you?

A. Oh! a good deal.

Q. But how much?

A. Oh! well, I don't remember, but it was quite a little.

We could cite many other examples.

NAMING OF COLORS. It often happens that a general paralytic cannot name the colors exactly. He recognizes the colors very well and also knows their names, but he cannot recall a name at will and he gives another in its place. We have found cases somewhat similar among imbeciles, but the difference is that the imbecile either does not know or partially knows, while the para-

lytic knows but cannot remember when it is necessary. For example Colon, a house painter who has the level of ten years, should because of his profession know the colors very well; he is of an intellectual level that should be able to name them since a normal child of eight years names them.

Colon has nevertheless much difficulty. He says,

For red, "That is bright red."

For yellow, "That is—pale yellow."

For blue, "That is dark green—it is dark blue."

For green, "That is light dark—light yellow."

He therefore failed on the blue and for the green gave a curious reply; perhaps by light he meant green. In any case we ask him to repeat and he says, "red, light yellow, bue (instead of blue), pale green" which is nearly correct. Thus he knows but cannot at once show his knowledge. This inability is truly the most annoying thing that could happen to a candidate during an examination.

DIFFICULTY IN PRONOUNCING WORDS RAPIDLY. It is the same experiment but with a variation which adds to the difficulty; one must not be satisfied with simply naming the colors; they must be named quickly, very quickly, as quickly as possible. Thus the varied functional insufficiencies manifest themselves.

Bernard is a woman forty-five years old, who has the level of seven years. We show her a sheet of white paper upon which are pasted four papers, red, yellow, blue, green. At our invitation she names them correctly. Then:

Q. Couldn't you go a little faster?

A. (Trying to go fast.) Red, green (correcting herself) no, yellow—green, yellow, green.

That took seven seconds, a very long time, because for a normal adult one and a half seconds suffice.

Q. Try again.

A. Red, yellow, blue, yellow—no, blue.

Thus when she repeats the operation with the idea of going quickly she fails. She has forgotten the name of green.

(Showing her the green paper.) What is that color?

A. (After having put her finger upon the paper and having thought a long time) Like chicken eggs—no duck eggs—(Correct, because duck eggs are a tint of green).

Q. Yes, but what do you call it?

A. (After a long meditation which lasts five seconds) It is green.

Q. Name them now as quickly as possible.

A. Red, yellow, blue, green.

Q. Still quicker.

A. No.

Q. Oh yes.

A. Red, yellow, blue (slight bewilderment) green. (Time, five seconds.)

Q. As quickly as possible.

A. Red, yellow, blue—and that, green.

Q. Quicker still.

A. No, it isn't fair.

Note that the considerable time of five seconds to name four colors does not contain the time of reaction to a given signal; we measure the duration of the pronunciation of the four words, starting with the first word pronounced. With others we give a signal and as soon as the signal is heard they must name the four colors; we count the total time from the giving of the signal until the word green, the last of the series, is pronounced using our watch that marks the seconds; this rudimentary chronoscope is quite sufficient because the time required is not less than four or five seconds. It is curious to see patients, who like Samse have a level of seven years and even others who like Philipon have a level of nine years, give such very poor reactions. One of them made an anticipated reaction and said the word before the signal was given; this was pointed out to her; she replied: "It was said all the same." Others remained some time without reaction to the signal. We said to one, "Come now, start!" Instead of commencing to pronounce the names of the colors she laughs and looks at us. Has she forgotten the order? We ask her:

Q. What must you do now?

A. Why, I must begin.

But she does not start, she does not pronounce a single word.

We might have employed a chronoscope for registering the times of reaction of our subjects but that would have taught us nothing. When the delay and the irregularities are so great, hundredths of a second become insignificant. This is because in reality something more than a slowness or a difficulty in the motor evocation of a word takes place here; the patient has lost the sense of the experiment and cannot recall what has been explained

to him about the way to proceed. This is not a slight, limited, local trouble, such as every normal person has experienced when fatigued; it is a general confusion in the sense of direction, which makes one forget, to speak familiarly, "where one is." We shall speak a little later of this general confusion.

SLOWNESS OF WORDS AND GESTURES. Another form of the difficulty of evocation; certain patients show an extreme slowness in replying to questions as simple as these, "Point to your nose! your eyes! your mouth!" An old woman named Gauze who has a level of seven years was so slow that we had the curiosity to take the time of her gestures. To point to her nose she took three seconds and her eye four seconds. Here is a bit of dialogue in which we noted the time which elapsed between the end of our questions and the beginning of her replies.

Q. How long since you came here?

A. (After 5 seconds) It has been—two weeks.

Q. What is your profession?

A. (After 3.5 seconds) I was cook.

Q. How much did you earn a month?

A. (After 4 seconds) Oh! that's nothing. When I was through I went away; they paid me.

Q. Is this morning or afternoon?

A. (After 2.5 seconds) It is afternoon.

If the reader wishes to realize the slowness of the reply let him take his watch and allow the indicated time to pass; he will thus see the extraordinary pace of our dialogue with Gauze. Other tests show this same trouble of evocation in more complex phenomena.

LAPSUS CALAMI. These are errors to which normal persons are subject in writing. When one writes quickly, or when one is pre-occupied by another thought than the one he is writing, or when one's head is fatigued, or finally, when one is writing amidst noise or distractions, it often happens that he skips a word or two. Such lapses are extremely frequent in the writing of general paralytics; usually dictating a few lines to them will suffice to bring this out; one would certainly not so easily obtain such lapses from a normal person who was either fatigued or absent-minded. Thus we dictate, "In the morning I walk in the country." The patient wrote, "The morning walk in the country;" or else they wrote *prone* for *promène* omitting the syllable *me* in

the middle of the word. Another, to whom had been dictated the sentence, "The pretty little girls study the flowers which they gathered yesterday," wrote, "The pretty girls studied the flowers gathered yesterday." To appreciate the gravity of these omissions one must take great pains in dictating. If one imprudently dictates words before the patient has finished writing those preceding, one will infallibly lead him to skip what has gone before. But we have a better example. Even in spontaneous writing the paralytic dement skips words; or rather, what is more serious, leaves a word unfinished and passes to the next. We have before us a letter written by a patient which eulogizes his talents as a painter. In this writing are to be found lapses like the following, "I took extraordinary models from Africa. I made resplen views. The sky was red." He has written *resplen* for *resplendent*, the second part of the word did not form itself under his pen. It is simply to comply with usage that we call this phenomenon forgetfulness; in reality it is produced by lack of evocation. We do not encounter these lapses so frequently among the morons; when a moron writes he does not usually omit many words.

ERRORS OF ARITHMETIC. For a long while alienists have found empirically clinical procedures which admirably bring to light the intellectual defects of these dement. Here the instinct of the investigator has gone ahead of his theory. It has been felt that the paralytic must betray himself in arithmetical operations because these operations require a mental application of which he is incapable.

Let us first see them counting sous; it is rare that a paralytic succeeds quickly in an exact calculation with sous. Thus Colon, who has a level of ten years and represents one of our most intelligent patients, counts 17 sous when there are only 16. Most of them are so; they neglect a sou or two or they forget them. It is the same thing when dressing themselves or buttoning their clothes. Forgetting some of the sous is the same thing as having a dirty beard; it reveals the same mental state. We say negligence, because if we call their attention to it and tell them to be more careful they are able to count without error.

When we give them written additions where there are numbers to be carried the operation is always difficult for them. One sees many of the paralytics act as though there were no number to be carried. Example, $36 + 29$, he calculates thus; 6 plus 9

equals 16, he writes 16; then he continues; he says 3 plus 2 equals 5, he writes 5, and obtains a sum of 516. This is not the only error that he commits but it is the most characteristic since he recalls the process of the operation. In what does this error consist? The subject has not, properly speaking, forgotten the rules of addition; but he does not evoke them at the necessary moment; he does not remember that the 1 of the first sum should be added to the number in the next column.

Let us cite the example of Philippon who has a level of nine years and who nevertheless cannot do correctly a sum in addition, where there is a number to be carried. Here is a specimen of her work, four additions in which she has committed two types of errors, first, a frequent error of addition, and, second, a constant error of carrying consisting in writing the number to be carried as a separate figure.

Furthermore, in the simplest operations an unbelievable number of errors is possible. We shall cite a few examples.

54	38	84	29
66	56	78	43
<hr/>			
11 11	8 16	13 12	6 17

Addition executed by Philippon, general paralytic, who has a level of nine years.

In the first place errors in the arrangement of the figures; as, when 4 is to be subtracted from 11, they write 11 below 4 and try to take 11 from 4; or they completely forget the number to be carried; or again, whenever there is a number to be carried especially if the question is complicated they abandon the operation in the very midst.

The following addition was given to Samse, 4 + 12. She counts, 4 and 2 are 6, and 1 are 7 and writes only the last figure.

DISORDER. Another confusion appears in their calculation which is very curious. Let us suppose them to be doing a problem which requires a multiplication and afterwards a division. The beginning of the operation is easy enough; then in the midst of it they stop, are lost, and can no longer call up the conditions of the problems; no matter what effort they make they cannot gather up the thread. This state of disorder may be explained, it seems to us, in the following manner; when one performs a

problem there is a train of reasoning that he follows out; he passes from argument *a* to argument *b* then to *c* then to *d*, and when he arrives at *d* he has still present in his mind *c* and *b* and *a*; he has the perception of the order followed up to the point where he stands; and he sees briefly the whole route that he traversed; if he does not see this clearly, he has at least the feeling for it. This permits him to continue in a direction which is in harmony with the commencement. In the paralytic this subconscious evocation undergoes an eclipse; the idea flies, it disappears. It is like a signal light that vanishes; one cannot relight it so remains in darkness. Another comparison perhaps better and already used by us is that of the chess board. While one is studying the disposal of the pieces some one passes, hits the board and all the pieces are jumbled together. It is this chaos that is produced from time to time in the mind of the dement. He is conscious of this and says himself that he no longer knows what he is about.

A very simple example is furnished us by a young man, Alexander, whose level is that of nine years. We say to him after putting money before him, "You are a merchant; here is money for you to make change from; and here is merchandise to sell. I will buy this box which costs four sous. I pay you with the twenty-sou piece. How much change will you give me?" This explanation is repeated a great number of times. Then we say to Alexander,

Q. How much will you give me back?

A. Well, 4 sous. I give you back 4 sous. Here they are.

And he gives us the 4 sous.

Q. Let us see, how much was the box?

A. 4 sous.

Q. And I gave you how much?

A. 50 centimes.

Q. (Showing him the 1-fr. piece.) I gave you how much?

A. 1 franc.

He had inadvertently made an error, having mistaken a 1-fr. piece for 50 centimes. But this was not his only error.

Q. So you should give me back how much?

A. 16; 16 and 5, that makes 21. 21 and 3 that makes 24.

Q. You will give me then?

A. 23.

Q. 23 sous.

A. You need still more—7, 3 and 7, 30, and 6, 36.

This would be pure gibberish, if we had not followed step by step the ideas of Alexander and if we had not taken into account the manner in which he reasoned. Let us analyse. We obtained a first point; he is conscious that he should give us back 16 sous. But immediately afterwards he loses his direction; seeing some sous before him on the table, he thinks he must add them to that sum of 16; so he adds the piece of 5 sous which is on the table then 3 sous which makes 24, and he thinks that he should give back 24 sous. Here is a slight lapse for, having announced 24, he forgets and believes that it is 23. Then seeing that we still wait he has the idea of continuing his addition. To the 23 sous he adds all that he finds upon the table, first 7 sous, which makes 30 sous, then 6 sous, which makes 36 sous. In reality he is completely lost because he has abandoned his first idea and seems no longer to think of it. It is important to note that the operation does not by any means surpass his knowledge, his intellectual level; the proof of this is given in what follows.

Q. Well then, let us begin again; the box costs?

A. 4 sous.

Q. I gave you?

A. 1 fr.

Q. Well then, you should give me back?

A. (In a clear tone without hesitation) 16 sous.

It is characteristic in these losses of functioning that the subject knows how to do the problem submitted to him; he has the knowledge but from time to time the power fails him. To Colon, the house painter who has a level of ten years, we gave a simple written subtraction to do, $25 - 9$. He wrote 25 and put the 9 below the 5.

Q. Calculate.

A. 9 and 5, 14; I carry 1; 1 and 2, 3, 34.

He has forgotten that he was to subtract and he makes an addition. The operation takes 30 seconds.

Q. So 25 less 9, that makes 34?

A. Yes sir (thinking it over), Oh, no; (he calculates again) 5 and 9, 14, I carry 1; 1 and 2, 3.

He repeats the same error. He is shown that he was wrong in making the addition. He starts again the same way.

Q. But I said 25-9. So 25-9 that makes 34?

A. Oh! no. That makes——, 25-9 that makes 21.

Q. Calculate out loud.

A. 25, 34, less 9, 34 less 9 that makes 20. 25 less 9, 15, 16, that makes only 16. Yes, 25 less 9, that makes 16.

This second operation has taken one minute and fifty seconds which is an enormous time if one takes the pains to realize it watch in hand. Notice that he has reached the true solution, which is to be expected since he has the level of ten years, but he has not attained the end without losing himself three times on the way; it was necessary each time to expressly demand, "Is the result correct?" to make him perceive that he had made an addition instead of a subtraction. This loss of direction indeed supposes an insufficiency of evocation. To follow a direction, the directing idea must be prolonged either unconsciously or by short successive recurrences. Here we have seen with what facility it disappears.

We now come to the phenomena of reception; perception, comprehension of that which goes on about the individual. In these phenomena of reception the absence of evocation also makes itself felt. Here the sense of the word is a little diverted from its usage, because it is no longer a question of memory properly so called but of perception. We must admit however that in the formation of a perception there is implied a recalling; we perceive an object only because the stimulus of the sensation evokes some former knowledge, some acquired images. It is these implied evocations in every exterior perception which are badly formed in the general paralytic. Some unusual phenomena result from this; we are going to study some of these phenomena, notably the incomplete perceptions.

INCOMPLETE PERCEPTIONS. In incomplete perceptions the sensations which ought to be the point of departure of the evocation are indeed felt, but only certain ones of these sensations make the evocations; the others rest inert; therefore, an incomplete fragmentary perception results which one can very simply illustrate by the use of playing cards.

Madame Gauze knows the cards. When asked to name those presented to her she indicates the suit correctly; for the value she is often obliged to count with her fingers. If a card is presented to her and she is asked simply to name it she usually indicates either the suit or the value, rarely both. Example,

<i>Cards Shown</i>	<i>Replies of Subject</i>
Ace of clubs	Ace
Queen of clubs	A Queen
Jack of clubs	A Jack
Jack of hearts	A Jack
Eight of spades	Eight of hearts
King of clubs	King of hearts
Queen of hearts	(correct)
Ten of spades	Spades
Ten of clubs	Clubs
Eight of clubs	Eight of spades
Queen of diamonds	A Queen
King of hearts	The King
King of spades	Well, that's the King.
Q. But what is he called?	The King of spades.
King of diamonds	The King
Jack of diamonds	The Jack

Is there here a defect of perception or a defect of evocation of the name? It matters little, the essential thing is to record that there is a defect. Another example shows the same defect, the same negligence being produced also by cards but under rather different conditions. We show the woman Philippon the nine of clubs.

A. That is clubs.

Q. How many of clubs?

A. The seven.

Q. (With surprise) Ah!

A. On no! the nine, I am mistaken.

Q. You must remember that it is the nine.

A. Certainly.

We place the card in a pack which is presented to her.

Q. Find it now.

A. (Gaily) Sure, I must find it, my card.

She looks at the cards one by one, and makes two piles, one of red the other black, with errors from time to time in this useless assortment. During this operation the nine of clubs passes under her eyes.

A. (Saluting the card) Here it is, my beauty. Come my old friend. But instead of taking out the card she puts others on top of it. We say to her.

Q. You have not found the card. Give it to me.

A. Oh! yes, I found it, it is the nine, and here it is.

She hands us the seven of clubs which she has just found; but then she shows a slight hesitation and perceiving the eight of clubs which came next she hands that instead of the seven.

Q. Is that really the card that you were to give me?

A. (Without looking at the card.) I am not mistaken.

Q. Is it really the one?

A. I tell you I am not mistaken.

Q. Come now, look at the card (showing the eight of clubs). What is this card that you gave me?

A. It is the eight.

Q. And you should give me?

A. The nine.

Q. You have not given it to me?

A. (In a familiar tone.) Rascal!

She hunts in the pile and finds the ten of clubs and says:

A. Here is the ten of clubs, the nine is not far away.

This illustration shows several things, a defect of evocation of the right name, negligence, power of action inferior to knowledge.

ILLUSIONS IN EXTERIOR PERCEPTIONS. We shall group with partial perceptions certain psychological phenomena which have an entirely different aspect but which depend upon the same fragmentary character of the perception. When our patient, to whom we show the six of hearts, tells us simply that it is six he forms an incomplete perception; but incomplete as it is the name remains correct, because the suit and the value in a playing card are distinct facts to be noted. It is no longer the same when the perception bears upon a collection of objects, a picture or an engraving; each of the elements in such a group has a significance which depends at the same time upon itself and upon the rest; if one perceives it separately one may be deceived as to its nature. Therefore the number of errors which these patients make upon pictures is very great. Philippon (nine year level), to whom we show a picture representing a prisoner standing on his bed to look out of a narrow window, imagines that the man is perched on a rock; Bern sees in the cart of the ragman a horse which does not exist; Gauze, allowing her indolent glance to wander over a picture representing a poor old man and a woman seated on a bench, gives the following information.

Q. What is there, here?

A. A man who is all white, and then his wife who is all black (if the man appears to her all white it is doubtless because of his white beard).

Q. And what else?

A. That! (she shows the trunk of a tree). And there a bench.

A. And what besides?

A. A spoon.

Q. A spoon? Where is it?

A. There, I think that is a spoon.

Astonishing illusion; the scene clearly takes place on a boulevard. Where does she see a spoon?

Q. Show me where the spoon is?

She follows with her finger the picture of a street lamp. Thus she mistakes for a spoon the street lamp, which in this case, would be very large and planted in the ground. We persist.

Q. But where is all this which is happening?

A. Well it is the man who is white and his wife who is black.

Q. But are they in the house? Where are they?

A. They are on a bench.

Q. Are they in the country, by the road?

A. Well, there wouldn't be things along a road.

Q. What kind of things?

A. Well, there is no housekeeping on a road——(not clear).

Q. But listen. Here are trees.

A. Yes.

Q. Then it is in a garden.

A. Yes.

Q. How could there be a spoon like that in a garden?

A. I don't know. I said a spoon as I would say anything else.

This illustrates the illusion of the senses among these patients, an isolated perception which is false, which is not correlated with the rest, and which is not corrected.

ILLUSIONS IN VERBAL PERCEPTIONS. Here it is a question of perceiving and understanding a sentence pronounced by another person. Every sentence is a composition of words, each of which has not only its own sense but a sense determined by the rest of the sentence. If one perceives but one word of the sentence, or but a single syllable he may build upon it a perception which will be not only incomplete but above all erroneous. These verbal illusions though not very frequent often occur among general paralytics. We have noted a certain number of them. Gauze, before whom we talk and exchange the remark, "*Nous avons oublié ça*," (We have forgotten that) says to us spontaneously, "*Je suis née à Epernay*;" (I was born in Epernay); it is

probable that she perceived the isolated sound *oublié* and interpreted it to be *où est née*. Another, Bern, hearing one of us say to the other, "*N'est-ce pas?*" (Is that not so?) was impressed simply by the sound and understood *Espagne* (Spain) and said to us, "In Spain you know they are very false; in Portugal they work. I lived with a French woman——" after this came a description of her life as a house maid.

Thus, partial perceptions may give place to verbal illusions. But we repeat this phenomenon is quite rare.

INERTIA OF COMPREHENSION. The study of verbal illusions as well as that of incomplete perceptions puts us upon the track of a more general phenomenon, that of the inability to comprehend the thought of others. We have often been struck by the difficulty which certain patients feel in understanding our verbal explanations; the least complicated explanation often does not penetrate; this is therefore a very serious obstacle when making psychological experiments upon them, because a psychological experiment is always dependent upon the primary condition that the explanatory remarks be understood; it is only after this first requirement is realized that one can go on with the experiment.

What illustrations we could give of this difficulty in understanding! Here for instance is the old woman, Gauze, who has a level of seven years and who besides knows how to count. We show her four single sous, and ask her, "How many are there?" She replies correctly, "four sous." We take away one and add three double sous which makes nine sous. We ask her again, "How many are there now?" She replies, "6 sous." As this is incorrect we say to her, "Count aloud." She commences to count, counting only the double ones, and says, "two, four, six sous."

Here is the rest of the dialogue.

Q. How! there are only six sous?

A. Ah! with those three sous there.

Q. Count again.

We imagine she is going to count the single sous with the double ones. Not at all.

A. (She looks attentively at each sou and says) A Republic. One sou. Two sous.

The idea of counting, although so natural when one sees money, has disappeared. We are obliged to insist in order to make it return.

Q. How much money does that make, all that?

A. Two, four, six, seven, eight, nine.

Here at last is the exact count. So she knows how to count but she is not able to grasp the idea that she must do it. This instructive scene ends by the following remarks from the patient.

"My husband, he says, you ought to go to school. Very well, I am very sorry because I shall never get away. (She weeps.) So it was the doctor who said I must go away from home. I did not know that it was here."



FIG. 20. Mlle. PHILIPPON; GENERAL PARALYTIC; INTELLECTUAL LEVEL OF NINE YEARS: NOTE THE SMILE OF SATISFACTION AND DISARRANGED TOILET.

Here is another very typical example of the difficulty in understanding. We wish to have some one repeat numbers in a descending order; for example to start at 20 and recite the lower ones 19, 18, 17 to 0. For a normal this explanation would be sufficient; as soon as our brief instructions were given he would

commence to pronounce the figures in the indicated order; he might be obliged to go very slowly or he might commit many errors, the execution of the experiment might be more or less defective but the idea of the experiment would have been grasped.

Let us now take a general paralytic and see how much time and explanation are required for him. Philippon has the level of



FIG. 21. PROFILE OF M^{LLE}. PHILIPPON.

nine years and consequently retains considerable intelligence. We give the entire detail of the test.

Q. Will you count backwards beginning with 20, as far as 0? Do you understand?

A. (With a satisfied air). That is not difficult.

Q. Well begin.

A. 10, 20, 30, 40, 50, 60, 70, 80—

Q. No, not that; you must count as I do. 20, 19, 18, 17—and so on down to 0.

A. (With a nod of acquiescence.) Yes.

Q. Commence, 20!

A. Let's say 10.

Q. No, say 20, 19, 18, and then?

A. 30, 40, 50, 60, 70, 80, 90, 100, 1,000. There!

Q. But no. Listen to me. You are going to do as I do. I will do it first, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0. Do you understand?

A. Yes—3, 4, 5, 6, 7—

Q. But, no!

A. (Continuing) 8, 9, 10, 11, 12, 13—

Q. But, no!

A. (Continuing) 14, 16, 17—

Q. But no! Stop! That is not it. It is in the other direction you must count.

A. Yes, I counted forwards.

Q. You must count backwards. 20, 19—

A. 20, 19—

Q. (Prompting) 18, and then!

A. And then 20, so 22, 24, 26, 28, 30.

Q. Listen. Do as I do! 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0.

A. Oh! very well. I will do like that. 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10—I've lost it—9, 8, 7, 6, 5, well 3, 5, 4, 3, 2, and 1—and to go on 25, 30, etc.

She took 35 seconds to count backwards, a considerable time.

Q. Try to go quicker, 20, 19,—

A. 36, 37.

Q. No, not like that, 20, 19, 18,—

A. 20, 19, 18, 17, 16, 17, 16, 15. I've lost it.

Q. 14.

A. 14, 13, 12, 11, 11.

Q. 10.

A. 10, 9, 8, 8, 6, 5, 3, 2, and 1.

This time it required 45 seconds.

In analysing this long attempt it can be seen that our patient has understood only because we have had the patience to give her six complete explanations, while in general a single one suffices. But notice that this woman knew very well how to count backwards since she finally succeeded; it is not, therefore, the knowledge that is lacking but the comprehension of what is asked of her. All this is a remarkable example of inertia of comprehension.

We ask Vigne.—“How many fingers have you on the right hand?” She asks to have the question repeated.

A. On the right hand? I have two hands.

Q. But how many fingers have you on the right hand?

A. I have ten.

Q. On the right hand? I ask you on the right hand! The right hand!

How many fingers have you?

A. Very well I have two (showing both hands).

Q. No, on your right hand, how many fingers?

A. (She only gives a questioning, astonished look.)

Q. How many fingers have you on the right hand?

A. Ah! I don't know what you mean.

We put exactly the same question to her sometime afterwards.

A. Well, I have five.

Q. And on the left hand?

A. Oh! well, I have five.

Q. And on both?

A. Well that makes ten.

She knows then how to reply and to give the very simple information that is asked of her, but she does not understand what is wished of her.

This continual lack of comprehension often prevents their taking part in a directed conversation, a very striking contrast by the way, with what we have observed among imbeciles. In a disconnected conversation, especially if one follows their lead, they may for a time give a false impression of the value of their intelligence, as they habitually show a greater fluency than imbeciles, but a precise and definite questioning immediately brings out their deterioration.

Psychologically, lack of comprehension consists in the absence of suggestion of ideas. A person who understands has a train of ideas following the words heard, and the ideas correlate with the words; a person who does not understand, to whom one speaks for example an unknown language, hears the sounds but the evocation of ideas does not take place; or possibly ideas are evoked whose falsity is at once discernible. Among our patients we sometimes observe, in cases such as we have just cited, a complete absence of evocation; or, at least if the absence is not rigorously absolute, which probably never occurs, it is sufficiently striking for the patient to have the feeling that he has not understood, or indeed for the idea evoked to be insignificant. But now and then a false idea is produced which constitutes a contradiction. This contradiction manifests itself more clearly in two somewhat different cases where the phenomena is a little more complicated,

which we shall call *greffage* [grafting], and incongruous replies. In lack of comprehension there is only inertia disclosing itself by a negative state, a repose; in *greffage* there is a certain intellectual activity.

GREFFAGE. In a conversation, apropos of a poorly understood question for example, or a picture to be interpreted, it often happens that a general paralytic does not content himself with an irrelevant reply, but grafts upon it the aimless development of an idea.

Let us cite examples. Samse is in the act of repeating words that have been given her and this is the way that *greffage* occurs.

Q. Papa.

A. Papa.

Q. Shoe, hat.

A. Shoe, the hat.

Q. I am cold, I am very hungry.

A. I am cold, I am very hungry.

Q. I have a handkerchief. I have clean hands.

A. (Nowise distracted.) Of course I have.

Q. You did not repeat!

A. Oh! yes, I did say it.

Useless to argue. Let us continue.

Q. (Giving a sentence to repeat.) My name is Gaston! Oh! the dreadful dog!

A. Ah! ah! that's true, so it's a dog, that's all right.

Q. (Giving with energetic accent a new sentence to repeat.) It rains in the garden! Joseph is doing his lessons!

A. Ah! ah! that's good.

Q. You have repeated?

A. Oh! yes.

Q. What did you say?

A. I said that was good. Joseph works well then.

Let us notice what happens. When the repetition is easy Samse does not fail; when the sentence becomes longer and the repetition is consequently more difficult Samse ceases to make the necessary effort to reproduce the sentence verbatim; she fixes her attention upon the idea expressed by the sentence and the grafting begins.

Another example furnished by Bern. We have her repeat some sentences. She does it correctly, then the grating begins.

Q. My name is Gaston. Oh! the dreadful dog!

A. Oh! the bad dog. I had Ture, a pretty bulldog—

Q. We enjoy ourselves greatly; I have caught a mouse.

A. Oh yes. I have caught a mouse. There were rats above—there is a granary, etc.—

Here is a similar example of grafting in the definitions.

Q. What is a fork?

A. A fork, it's a fork. I have three of silver. But they are marked.

Q. What is a horse.

A. There are horses at Corbenay. I have seen cows; and ducks; they lay eggs, and then the chickens, there are chickens. Yes, ducks lay eggs, etc.

The same is true with Philippon.

Q. Papa, mama.

A. Papa, mama, my sister, my brother, cousins, plenty of them, my cousin who is, etc.

Q. Shoe, hat.

A. Shoe, hat. I have a beautiful hat with violets.

Q. It is cold, I am hungry.

A. Oh yes, on the contrary it is warm. I am hungry, I hope to go home to have good things to drink and eat; we never get enough; it is like the two ladies, there, they have eaten nothing this evening, it is too long, it is necessary to force everybody; at Grenelle I shall stop to get my watch. And then I am going to have my teeth pulled, etc.

Q. We enjoy ourselves greatly, I have caught a mouse.

A. Oh! the poor little creature. I would love to have one of those little creatures in a cage. I used to sell matches, and birds at the market. I have done everything. I did then as well as my sister-in-law, etc.

Exactly what is this *greffage* from a psychological point of view? It supposes indeed a certain inertia of comprehension because a patient who understood clearly that he was to repeat a sentence and nothing else would avoid adding whole sentences of his own invention. In addition to this there is nonsense, that is to say an absence or a weakness of direction; there is also a certain cerebral activity that manifests itself under a form which has no need of reflection nor of effort. At first thought, this intellectual activity seems contradictory to our hypothesis of inertia of evocation; if all their ideas were struck with inertia how would all this garrulity be possible? It is because the inertia of evocation may manifest itself by the failure to evoke the correct idea, the precise one which is needed, and while the only idea of which there is need is not aroused, a swarm of other ideas rush in which are indifferent or really false.

INCONGRUOUS REPLIES. Here are some singular replies. They are not absolutely lacking in sense but they have no rela-

tion to the question. These replies are frequent among certain general paralytics but not among all. So far as we know they have not been pointed out up to the present; they have without doubt passed unperceived; and we understand why because we ourselves did not notice them for a long time; we collected them in our stenographic work without realizing their import. When one of our patients made an incongruous reply we disregarded it; we attributed it to some casual circumstance without significance. For instance, we supposed that our patient in listening to us had a moment's distraction or perhaps that he was hard of hearing. Here are some fragments of these dialogues. We choose our examples of course from the clearest cases; not all cases are equally incongruous.

We ask Holog, who was once a cabman on his own account and later was coachman for another,

Q. Why did you go out of business for yourself?

A. The hackney-coaches.

Q. Yes, but why did you go out of business?

A. Yes, I had coachmen.

A. But why did you quit?

A. Ah! because—went home. Then I hired out to some employers.

Q. Yes, but you had been proprietor. Why did you cease?

A. Because I had enough; because I had to work myself.

However mediocre this last reply he might have given it at first.

Q. How long did you stay with your employer?

A. Oh! I stayed a long time with him, three years.

Q. Where were you before?

A. I was in business myself.

Q. Where was that?

A. For fifteen years.

He replies to a question of address by information about the time.

We ask another patient, a woman 36 years old.

Q. Madame, what is your name?

A. Louise, Apolline.

Q. How old are you?

A. I am—lay—No. 3 (incomprehensible reply).

Q. Let me see, what did you say?

A. It was in the blind alley Barrier.

She lived rightly enough No. 3, Blind Alley Barrier. She gives her address when asked her age.

Q. But how old are you?

A. Thirty-six years old.

Q. In what year were you born?

A. In Crépé—Saône-et-Loire.

She was born in Crépy-en-Valois, Oise.

Q. How is that?

A. How is that?

Q. In what year were you born, I ask?

A. Ah! I don't know, because I was little at that time.

She replies by giving the place of her birth when asked to give the date.

Again:

Q. How much does your husband earn?

A. His name is Vanbergh. There is an *h* at the end.

Q. But how much does he earn?

A. How is that?

Q. But how much does your husband earn?

A. His name is Vanbergh.

Q. Yes, but how much does he earn?

A. I do not know what he earns.

Q. And you, what do you do?

A. Yes, he has a lame foot. He got a splinter in his foot.

Same remark. She gives her husband's name when asked how much he earns.

Bern, a woman of forty who has a level of seven years, abounds in incongruous replies.

Q. At what age were you married?

A. I kept house for twelve years.

This is not a reply to the question.

Q. How old will you be when you are a hundred years old?

A. I will be old. I won't go to a hundred years nor my husband either.

Q. But how old will you be when you are a hundred years old?

A. I won't go to a hundred years.

Again an answer which does not fit the question.

We ask of Samse.

Q. Are you a lady or gentleman?

A. (Laughing) Oh! I am not a gentleman,—oh!

Q. Are you a little boy?

A. I have none.

Always the same incongruity.

All these nonsensical replies suppose that the question has only been partially understood by the patients. They understand that a question has been asked; they even understand some words of the question or its general sense, but they do not grasp it in its integrity nor get its shade of meaning, so the reply is indirect. It is the same mechanism as that which produces partial perceptions; the mechanism is as follows. Not all the words heard evoke their appropriate images; there is only a fragmentary perception of the sentence, although, a circumstance important to note, the question asked is not above the intelligence of the

patient. It suffices as a rule to insist, to raise the voice, to arouse the attention, in order to destroy this psychic deafness and finally to obtain a correct reply. Furthermore a development of ideas is produced by inertia. The patient in whom an idea has been previously awakened continues it, without asking himself if it applies to the present case. The following example is characteristic.

Q. (To Bernard) Show me your right ear.

A. Here it is. (She points to it.)

Q. Show me your left hand.

A. These are my little ears.

She continues to think of her ears either because she does not understand the new question or because she finds it difficult to leave the first question. It is inertia; but it is the inertia of movement, the continuation of an impulse, a ball which continues to roll.

In that which precedes we have taken no account of the clinical signs by which one habitually recognizes general paralysis. These signs are too complex and at the same time they are known in too inexact a manner to serve in the building up of a psychological theory. Indeed they are known chiefly through the testimony of relatives or sometimes by the very incomplete accounts given by the patients themselves. It only remains to be seen whether they contradict the observations which we have here presented. It seems to us that they do not.

An important fact which has struck all alienists is that it is by his state of being and his acts rather than by the disorder of his speech that a patient betrays the change which takes place. The acts which attract the attention are variable. They differ according to the individual, according to circumstances, according to chance. They may be classed as errors like negligence, forgetting important matters, destroying useful things, delays, abandoning of work for no reason; faults of housekeeping, for example, meals not ready on time, the food too salty, or burned; useless expenditure; carelessness of dress; and lastly delinquent acts, robbery, petty thieving, indecencies, etc.

Among these clinical facts we shall choose only one, which is very characteristic and which may be observed as soon as the

patient enters the asylum; it is the unconsciousness which he shows in relation to his new situation. Many cannot find their direction, they do not know where they are, they know neither the day, the month, nor the hour of the day; they do not, therefore, take into account the little external signs which should permit them to orient themselves. A patient, writes Kraepelin, replies that it is January notwithstanding there are fresh cherries on the table. We recall having seen a woman about fifty years of age who was only at the beginning of her malady and who in her conversation showed herself so intelligent, so sensible, that one would not suspect any intellectual weakening; yet already she showed that indifference to her surroundings which is so characteristic of paralytic dementia. To thoroughly understand this indifference and above all to judge of it let us imagine how a perfectly normal person would feel if he were locked up in an asylum; let us put ourselves in the place of such a person; the most careless of us would be disturbed and irritated by this sequestration. We should want to know where we were and why we were locked up. The first time our patient was brought to the office and introduced to us she seated herself tranquilly in a chair, drew her glasses from their case, and began to read the paper as if she did not understand that it would be to her interest to know who we were and what we wanted of her. Note that she had only just been brought to the hospital. There was therefore in her a lack of comprehension of the surroundings, a state which resembled metaphorically that of partial perception; it was as though she saw only the table, the chairs, the wholly material part of the office, and perceived nothing beyond and did not realize that the office belonged to a hospital and that the hospital enclosed her like a prison. The ease with which such patients accept their sequestration was long ago noted by alienists; it is sometimes the only sign which they give of their intellectual weakening. In everything else they seem normal.

With others the trouble takes on a slightly different form. They demand their release every time they see the physician; but they do not seem to remember that the previous day they asked the same thing in identical terms and, moreover, that it has lead to nothing, and that during the interval of the visits of the physician they paid no more heed to their release and spoke of it to no one.

It seems to us that nothing in all these diverse facts is contrary to the explanation which we have given of the lack of power of evocation; to forget important objects, neglect to salt the food, or salt it twice, or, again, to lose the sense of propriety, of modesty, or even of duty, all this attributed according to the case to loss of memory, of judgment, of attention, to the "I have forgotten," "I did not pay attention;" but all this should be explained, as we think, by a weakening of the power of evocation of ideas and feelings; the last idea does not reappear and, hence, forgetfulness, inattention. The correcting sense which would inhibit the grotesque or immoral act does not awaken, and hence, the loss of judgment or of moral sense. One has therefore no trouble in harmonizing clinical facts with the theory which we have just outlined; but let it be clearly understood that we prefer to rely upon personal and direct observations, rather than clinical histories which are too often obtained second hand. Clinical facts will not serve to construct or to demonstrate our theory; let us content ourselves with proving that they do not contradict it.

3. CONSIDERATIONS UPON THE DIFFICULTY OF FUNCTIONING, ITS EXTENT AND ITS CHARACTER. We have already cited a great number of examples of this lack of evocation which we believe to be characteristic of paralytic dementia. We have been able to note that according to the domains considered the phenomenon of evocation takes on different aspects; for the acts of memory it constitutes forgetfulness; for movements and acts it shows itself either by lapses in writing or by a lack of continuity in occupations; for perceptions it is equivalent to defect, almost to anaesthesia that is, as it were, psychic deafness. At other times the same phenomenon has been designated under the name of lack of attention, or distraction, or negligence. But under these different aspects and in spite of this varying terminology we always find a weakening of the same faculty, the faculty of evocation.

In the light of all these observations this faculty appears as one of the most important parts of the intellectual mechanism. It does not consist solely in awakening an isolated memory, it is not limited to a mere detail of the memory function; it comes into play in all intellectual operations; it furnishes them their necessary food because all intellectual work is performed by means of ideas, and these ideas need to be evoked. Let us

illustrate exactly what happens. That which we use for work is not at all a single idea which is illuminated for a moment and is quickly extinguished, like someone who has only one gas jet which he successively lights and extinguishes. In reality every work supposes a considerable number of ideas which have sometimes been called a constellation. For an instant we have need for example, of idea 1; then, to continue the work commenced, 1 must be eclipsed and ideas, 2, 3, 4, 5, 6, quickly illuminated; then one returns to 1, then one has need of 7 and of 8; then they are extinguished and one lights 2, 3, 4, etc. So the work goes on by successive extinguishings and re-lightings which require that the whole range of ideas remain ready for active service; this is what assures the continuity of work, and what gives us the impression of its continuity notwithstanding the discontinuity of the lighting; it is this which permits a certain direction to be followed continually, a theme to be developed in all its ramifications. To sum up, this is the important phenomenon of which the cases heretofore studied have given us only slight examples. It is this broad sense which must be given to the phenomenon of evocation of the states of consciousness. And consequently, when we say that the work of evocation is imperilled in paralytic dementia, it is as if we said that the whole operation of thought is rendered difficult.

But we must go farther. Upon the whole, evocation is only one example of mental functioning and however important this may be it does not include all the rest. Mental functioning supposes many other forms of activity. There exists not only an evocation of the states of consciousness, but besides an acquisition, a fixation of these states; and when they are evoked they must be worked over, that is to say, compared, judged, combined, amplified, or on the contrary analyzed, reduced, or perhaps contradicted, neutralized or inhibited. Why should the reproduction of the states of consciousness be the only disordered part in all the mental mechanism? There is no reason to admit it. On the contrary, there is reason to suppose that our subjects are affected in all their mental operations whatever they may be.

To shorten this demonstration we shall cite only one well known example; it is the difficulty which a general paralytic experiences in fixing new impressions. All alienists know that they learn poorly. We give a simple test, which very clearly

illustrates this difficulty. Using a red crayon we draw a head on a large sheet of white paper placed before the patient. When it is finished we say, "This is Ernest." Then by its side we draw another figure, using a blue crayon and say, "This is Louis." Lastly we draw a third with a black crayon and say, "This is Antoine." Then repeating we say, "This is Ernest, this is Louis, this is Antoine. Pay attention to the names what I give them, Ernest, Louis, and Antoine." In this way we have named each figure three times in succession and each time the figure was pointed out. If one plays this little game with a general paralytic one will be surprised at the difficulty that the patient finds in retaining these three names and in applying them correctly. Thus Philippon, the woman with a level of nine years, cannot recall anything after the first instruction which, as we have said, consists in naming the figures to her three times. After a second lesson composed like the first of three namings she makes a mistake and names them in the following order, Louis, Ernest, Antoine. It requires a third lesson similar to the two preceding ones for the three figures to be finally named correctly.

Samse, another general paralytic a little lower than the preceding having a level of seven years, fails still more strikingly. After the first lesson she says, "Very well, Louis, Antoine—How about it? Joseph!—" The name of Joseph has not been spoken. After the second lesson she is sure that she can repeat it correctly, she says, "Sure enough, Antoine— How about it? What is his name? I don't remember." After a third lesson, she says, "Louis, Antoine—Yes, his name is Antoine."

Without further comment, and without the necessity for bringing in terms of comparison, it is evident that these defects in exact repetition after so many lessons, denote a profound weakening of the memory for acquired knowledge. The task to be performed was not only the conservation of several impressions, it was also necessary not to become confused, but to give the correct name to each figure; we demanded of the memory a certain gymnastic feat which is evidently very easy for an adult, or for a child of nine years, but which is singularly embarrassing for our subjects. We have reproduced this example at some length in order to show that the phenomena of deficiency in these paralytics extends not to evocation alone, that evocation

is only one example, which in fact we offer because it is clear, precise, and easily demonstrable; but we willingly admit—although the proof has not been rigorously made—that among general paralytics all forms of intellectual functioning are affected.

Will it be possible to indicate further how this is true, and in what the difficulty, the obstacle consists?

For a long while we have meditated upon these facts; and at first we believed that we could explain all the psychology of general paralysis by a diminution of voluntary effort. We said repeatedly that what is characteristic of the general paralytic is the impossibility of making an effort. This explanation seems to us now only partially correct; we take it up here only to pass beyond it.

At first sight one sees clearly that many of the tests in which the patients fail demand a slight effort; thus it requires an effort to count backwards or to work rapidly either in counting figures or in turning a handle. On the other hand it is particularly when one creates a slight difficulty for them that their intellectual incapacity shows itself. If one is contented with carrying on a colorless conversation with them, such as many people use while visiting, talking of nothing but the weather or the servants, they can reply to such commonplace remarks by others which are of equal value, for such remarks belong to their level, but in reality they cannot make an effort.

Let it be understood also that if they are prevented from making an effort, it is not because of a special attitude of the will or of the character; they are neither sulky, stubborn, nor peevish like certain of our imbeciles who positively refuse to submit to our experiments when they could easily execute them if they were only willing. Nor do they resemble those other imbeciles who, because of a feeling of deference do their best like good children. The paralytic ordinarily shows neither willingness nor annoyance, but rather a very particular mental state of indifference which is *sui generis* in this particular malady.

But in order to explain all that takes place in them it is not sufficient to assert that they are powerless to make an effort. That would be an error of interpretation. The effort is nothing else than an additional apparatus which gives more power to the intellectual machine, as the advancing of the spark is a par-

ticular condition which gives more speed to an automobile. But one uses these reinforcements only when there is an unusual object to conquer; under ordinary conditions the intelligence functions without effort. But just so with our demented the ordinary conditions do not suffice because what is easy for a normal has become difficult for them. Let us recall the examples that we have given before. The citation of proper names and of figures which comes at the first call of a normal memory is no longer possible with them; the dividing of the attention between two different elements, for example the color and the value of a card, can no longer be made; the memory of a sentence is disturbed if we merely dictate a new portion while the subject is finishing the writing of the first part.

These are failures of evocation and not disturbances in the production of effort. In order to agree with our previous explanation it would, however, be correct to say, that among paralytic demented the faculty of evocation functions with difficulty; and that because of some aggravating circumstance the faculty of effort, which might serve to compensate for this difficulty of functioning, is often equally affected which renders the case irremediable. All this reminds one of a village where there is not only a fire, but where the firemen are absent. The disaster is doubled, but the direct cause is the fire; the absence of the firemen only aggravates it.

The correctness of our interpretation is proved by what happens to our patients when they chance to be still capable of effort. Thus, Jonas, an aged woman who seems intelligent in spite of her decay, confided to us one day something of which we give the exact reproduction: "I have to take great pains," she said, "when I try to remember what day it is," and again: "You must believe that I do all I can. It makes me angry that I cannot overcome it—this apathy." There is with her then a slight power of effort, or the idea of effort, the willingness to try, but that is not sufficient; her effort cannot conquer that state which she calls apathy and which in our opinion constitutes an inertia of functioning. This proves therefore that it is not alone by the absence of effort that these patients are characterised. The absence of effort when it occurs, as it very frequently does, only aggravates the inertia of functioning which constitutes the essential character of the mentality of general paralytics.

Is this term inertia exactly correct? This is the last question that we shall discuss in this chapter. For those who have read attentively what we have written there can be no doubt. The troubles revealed so far with our patients consist especially in not doing any one thing, or in doing it incompletely, or in making mistakes in doing it, or in doing it with an excessive slowness; all of this is expressed exactly by the term inertia. And the word seems all the more fitting because so many of the patients have a heavy, stupid look with slow gestures, thick speech, and inexpressive countenance, and they appear fatigued, although when questioned upon this point they assure us that they are not tired and even that they never feel so. All these facts harmonize and it seems to us that we may well apply to these functional troubles the term inertia.

Nevertheless we find many patients who do not at all correspond to this conception; they are those who have delirious ideas and who fabricate a great number of them and who therefore show a strong intellectual activity. Delirium is sufficiently frequent among general paralytics for certain authors to believe themselves justified in describing this delirium as a representation of their mental state.⁴ It would seem difficult, at least at first sight, to admit that a delirious patient has functional inertia.

Here is Ramonot, a young man of about twenty-five years of age, who is worthy of being studied at length; let us interrupt ourselves to examine him in detail. The first time that we saw him he overflowed with satisfaction seating himself squarely in his chair, tipping himself backwards and twisting his thumbs while regarding us with a gleam in his black eye.

Q. What have you to tell us?

A. Always fortune in abundance. Always happy. What would you have. One always turns them (the thumbs). There is nothing else to do to be happy. Always in the thirty million who smile at you—

It is his favorite idea that he is soon to be decorated by Fallières. We try to make him talk freely upon this theme while we confine

⁴ Let it be said in passing, there is here an error. The delirious conceptions of a general paralytic are quite in harmony with the mental state by their incoherent and often childish character; but their description cannot replace that of the mental state which we have given; they are a manifestation, a product of that mental state, they are not the state itself.

ourselves to listening; he speaks slowly, searches a little for words and a good deal for his ideas.

Q. What are you going to do?

A. Well, we are going to march according to honor all over Europe, we are very good friends, very good friends, from all countries. We can march with head erect, with high hats. I do not know how to wear a high hat, I am going to wear a soft hat, because a soft hat is more becoming to me than a high hat. One always smiles, always. When one feels that everybody adores you that makes you happy—oh! that good M. Fallières. I want him to sign next to me. Mine is the last signature—it is he who is going to decorate me. And you know that everybody is happy. I press to my heart the Cross of the Legion of Honor—on my heart—when he says, "The powers which devolve upon me." He will not embrace me but his heart will be in it—etc., etc.

Upon our invitation the patient is pleased to dictate to us a letter to Fallières. Here it is reproduced exactly.

MONSIEUR LE PRESIDENT FALLIÈRES:

I thank you for all the goodness which you have shown me. I am happy to have the good wishes which you have shown me in your company, as have all the Presidents of the Republic who are happy to have me in their power. And I will always do my duty towards all the comrades who are under our orders—and all the people are happy to amuse themselves with the thirty millions of which we are in possession, everybody will be happy, will dance, will ride on bicycle morning and night; and as soon as we are returned from the bicycle ride we will have a good meal, and after the meal we will dance until we receive further orders and then we will continue during the whole year; we will attend the vintage, we will drink good wine, we will all go up into the vat, and so there will be no need of a wine press (he laughs) to take the grapes and we will taste the good wine, and after each meal we will take a glass of wine of cod-fish which will do us enormous good. I am happy for the decoration which I have the pleasure of wearing, I greet cordially all the Presidents of the Republic and with all my heart. Also signed: all the Presidents of the Republic.—*Ramemot Louis.*

At another time we wished to arouse some doubts in his mind concerning the object of his delirium or to scrutinize the reasons upon which he bases his belief in this story of his decoration.

The following dialogue takes place:

Q. You have seen Fallières?

A. I have always been in his service. From the time I was born I was always in his service.

Q. As domestic?

A. (In nowise offended) As friend, as president and for my goodness he decorated me with the greatest decoration and the same for all my brothers.

- Q. But you, have you seen him?
 A. Yes absolutely.
 Q. Where did you see him?
 A. At Longchamps where every one passes.
 Q. But did he speak to you?
 A. Like a brother.
 Q. To you?
 A. Personally.
 Q. At Longchamps?
 A. At Longchamps.
 Did he then have hallucinations?
 Q. You believe that?
 A. And even last year I found myself face to face with him in the woods.
 Q. And then?
 A. And then I applauded.
 Q. Did he get down from his carriage to speak to you?
 Listen to his reply.
 A. I did not have that trouble because after the offerings I made him that went from my place to his.
 Q. Did he shake hands with you?
 A. Never.
 He is frank. There was no hallucination.
 Q. But how do you know he is going to decorate you?
 A. By the praises he has given me. And it is because of this that he gives me the decoration that I merit and my certificate of good conduct. And the flag will not be forgotten.
 Q. But how do you know it. Has he told you?
 A. He has not told me personally.
 Q. How do you know it then?
 A. By the tone of his voice. When he reads that to the people—
 Q. What?
 A. He will proclaim it to all the soldiers.
 Q. But suppose you are deceived?
 A. Oh! I do not believe it. With friends like you, I do not believe it. His amiability extends to us even when we contradict him.
 Q. And if Fallières did not decorate you?
 A. Oh! I don't doubt that. I am persuaded because the crosses are already upon his desk.
 Q. You have seen them?
 A. Oh! no, but I see them from here.
 Q. That is indeed a proof.
 A. I see all the crosses lined up.
 Q. But really, you are not sure?
 A. Certain.
 Q. (To Dr. Simon who is present.) That is very well organised.
 A. It could not be better organised.
 Q. But you have not seen them, the crosses?
 A. Gentlemen my friends, you have seen them as I have. And you

too will have one of them. And we will pass at Longchamps before the soldiers.

Q. I also?

A. Oh! everybody. All the staff officers.

Q. Even the dogs?

He does not see the absurdity of the idea.

A. The dogs too—the dogs are friends.

Q. There will be a tiny decoration for them, too?

A. Little bows. We will be in line.

Q. But come now, the decorations, you have not seen them, it is an idea you have in your head?

A. It is an idea of grandeur.

Let us try to batter down his idol.

Q. Fallières is ugly!

A. He is ugly, but he is good as milk.

Q. When he gets angry he breaks everything.

A. He must not break the decoration, that's sure!

Q. What would you do?

A. I would weep.

Q. And afterwards?

A. Oh, well, I would laugh.

One can see here a curious character, the disconnected nature of the emotional life of the invalid.

Q. You are too young to be decorated.

A. But I have a good heart. It is there.

Q. Why do you say that your heart is good?

A. Because it is my mother who made it.

Q. But how does it happen that it is good?

A. Everybody loves me—

Q. Come, come! You do not believe all you have told me?

A. (with irony) Of course not. It is a dream.

Q. It is all humbug?

A. It is all humbug!

And as an attendant whom we have called comes to take him away, he says to him graciously, while showing him his trousers which are falling, "Button me up, my old fellow."

This happy man has a level of nine years and, it may be said in passing, one can see that his delirium has nothing to do with his level; some of our patients have no delirium although they have a level very inferior to nine years.

The letters dictated by this Ramonot remind us by their emphatic tone, by their basis of self-love, by the slowness of their delivery, of the discourse of our imbecile Cabussel which we have already published (see p. 80.) These lucubrations and these witty conversations, however poor in ideas, suppose always a

certain intellectual activity. Moreover, Ramonot talks with considerable fluency upon all subjects. One may see in this a certain objection to our theory. We might ask ourselves how can this intellectual activity be reconciled with the symptoms which we hold as characteristic of functional inertia. Inertia and activity, are they not contradictory? Yes, they are contradictory but not incompatible. Many observations have shown us that these are two symptoms which can be neighbors in the same mind.

Exactly what is functional inertia? It is a hindrance, a grain of sand, the lack of oil in the wheels of a machine. The intellectual activity, to continue the metaphor, is the force which is applied to this machine and which should be given out again; one can easily conceive that great force may be applied to a machine and that nevertheless, the machine is hindered by a resistance produced by the poor condition of its parts. But one of the most curious facts that we have observed in the course of our studies upon the insane is that when there is a diminution of the power of functioning they are unable to solve the more complicated problems although they can still do the simpler ones. With the use of our measuring scale we can easily perceive this. Let us cite examples. A little imbecile shows ill will in regard to us; she is pouty, sullen, scarcely replies, and is always anxious to get away from us. This girl still does the simplest tests, those of four or five years for instance; but she will not do those of seven or eight years although she is capable of doing them; consequently her ill humor produces an apparent lowering of her level. Another example. We recall a melancholy patient who, at the moment of our examination, was a prey to a violent moral affliction; we were able, however, to distract her from it for a few moments and she consented to reply to some simple tests; but as we passed to more difficult tests she had more trouble and finally ended in failure; a week later when the crisis of her attack was over we saw her again and when we measured her intellectual level we were surprised to find it higher. The hysterical attack of this melancholia patient has then produced the same result as the ill humor of the imbecile, an apparent lowering of the level. The result comes from a dynamic action, an inhibition. Among general paralytics the action is of a different nature; it is not temporary, but permanent; it is not suspended but destructive since they are incurable. But setting aside these differences the law remains the same and this

law may be expressed in the following manner. When some disturbance occurs in the mental functioning, either under the influence of ill humor or chagrin, or the material process of decay, this trouble manifests itself by an impossibility of solving the more complicated problems while the simpler problems still remain attainable.

Starting from this point it is easy to understand what takes place when a dement begins his ravings; the fabrication of his delirium implies that a certain intellectual activity sets the wheels of his machine in motion, but this activity is counteracted by inertia and the subject remains incapable of solving complicated problems; however, under the influence of this spur he will produce very simple intellectual results; for example, he will follow elementary associations of ideas, he will always discuss the same projects, repeat the same words and the same sentences. His intelligence is, as it were, divided into two parts; there is inertia for all that is complicated and on the contrary superactivity for all that is easy.⁵

⁵ Let us prevent any misunderstanding; in speaking of functional inertia we study the symptoms only from the psychological point of view and without being unaware that these may be caused by anatomical lesions. We might be misunderstood, for in the habitual clinical language the troubles called *functional* are the troubles where there are no observable anatomical lesions. Also to avoid any misunderstanding we have employed the terms lack of functioning rather than those of functional disturbances. But after these explanations there can remain no doubt as to the meaning of the words which we have employed.

III. DIFFERENCE BETWEEN THE TWO NOTIONS OF FUNCTIONING AND OF DEVELOPMENT

1. THE MENTALITY OF THE DEMENT COMPARED WITH THAT OF THE DEFECTIVE. This chapter is a logical and necessary supplement to the preceding. We are attempting to introduce into psychology a new idea, a distinction not previously made or only verbally made between the *functioning of the intelligence* and the *development of the intelligence*.⁶

The problem would indeed be very difficult to solve if it were put in abstract terms; fortunately for us we can materialize it in our own patients. In the pages which follow it will suffice for us to demonstrate the psychological difference between the dement and the imbecile because, as we see it, the chief lack of the dement is in intellectual functioning and of the imbecile is in intellectual development.

It is evidently necessary to distrust appearances and particularly to discern the true value of the symptoms. All that we have described as disturbances of functioning appears trivial enough and even so general that it seems impossible to imagine anything else as intellectual disturbances through defect. In the first place have we not all of us experienced these various disturbances? Who is there among us who, distracted or fatigued, has not ex-

⁶ We exaggerate perhaps when we say in the text that, up to the present time, no alienist has contrasted the lack of functioning of the intelligence and the lack of development. These expressions are not new. Recently an alienist remarked nearly the following: that which is a loss or an impoverishment in a dement is a lack of acquisition and of development with born defectives. Furthermore this terminology only gives a clear expression to ideas already very ancient and very reasonable as to the relation between mental defect and dementia; but it does not go farther than the metaphor which sees in the defective a person born poor never having acquired anything, and in the dement, a rich person who has lost his possessions and who is consequently impoverished. Under our pen these expressions acquire a new sense, because they are the result of observations and experiments which we reproduce in detail, and which show with precision the difference between functioning and development.

perienced those states where one passes over words in writing, where one feels a proper name escaping him at the moment of a pressing need to speak it, or where one fails to grasp the meaning of a sentence which he hears, where one makes errors of addition or loses himself in a problem? This is very common. But there is even a stronger objection. Do we not encounter among the imbeciles themselves these same troubles of evocation which we have analysed among general paralytics? Imbeciles also have difficulty in acting quickly, in counting backward, and are embarrassed by a problem; they also make at times incongruous replies, and are even guilty of *greffage* (grafting).

There is a certain test of an essentially functional nature, the arrangement of weights, which presents so much difficulty for general paralytics that one would be tempted to recommend it to practitioners as a test to detect slight cases of insanity or its beginnings, which would be very useful indeed in these cases, but when one tries this test on imbeciles they also fail equally with dementes. Therefore, since this is true, we are certainly going to be asked what clear, palpable, evident difference could be given between the imbecile and the dement, and how could this difference enable us to understand the distinction which we propose to establish between intellectual development and intellectual functioning?

A preliminary remark is necessary to the effect that the reason a general paralytic fails in a test is not the same as for an imbecile. The practical result is the same; it is failure but the cause is different. Thus when an imbecile fails to name the colors correctly, when he calls red, blue and yellow, green, it is generally because he does not know the names of the colors, or because he knows then insufficiently and his *n'importequisisme* is the result of his ignorance. With a dement we shall have the same errors of naming, but the subjects knows the names of the colors very well and his errors are made not because of his ignorance but in spite of his knowledge. The same is true in naming cards; the errors of the imbecile are those of ignorance; those of a paralytic dement can not be explained by ignorance because by exciting him, by urging him forcibly, we can succeed in making him name them correctly. In the same way when an imbecile fails in counting correctly a small sum of money, it is either because he does not know the series of figures or because he does not know how to apply

them; it is always ignorance under one form or another. Our dement on the contrary knows how to count but in spite of his knowledge he becomes confused.

Is the difference which we attempt to bring out between these two mental states after all very important? Perhaps it will be thought not. It can be summed up in the contrast between knowledge and power. But it may be said this difference exists among all of us; knowledge is a great circle and power is a very much smaller circle which is inscribed within the other. In less metaphysical terms we always know much more than we have power to perform. A child must thoroughly know the rule of the agreement of participles in order to apply it easily; and yet many years may pass during which he has been able to recite the rule glibly while all the time making a host of errors of agreement when writing. We are all children in this respect. In its application we are always inferior to the lesson which we have learned and which we can recite.

We reply to this objection that it is true, only there is an important difference of degree which we must take into account. If the distance between knowledge and power is great for all of us, it becomes enormous in general paralytics because they are hardly able to perform the hundredth part of what they know. A case in point, previously reported at length, is that of the patient to whom it was necessary to repeat six times in succession, using different terms each time, the mechanism of the act of counting backwards. And yet she knew how to count backwards as the event fully proved.

2. TWO PRACTICAL CHARACTERISTICS BY WHICH TO DISTINGUISH THE MENTAL DEFECTIVE FROM THE DEMENT. From this point of view, two practical signs result whose use we recommend in the clinic in order to make the distinction between the mentality of a defective and that of a general paralytic.

In the first place, that which distinguishes the ignorance of the imbecile from the functional inertia of the dement is that with the latter the failures and the errors have a remarkable degree of inconsistency, which indicates disturbances, accidents, while the negative results of the imbecile present on the contrary considerable consistency, something which is not a disturbance but is the expression of the limit of his mind. In fact we have seen certain dements fail before some difficulty and five minutes later triumph

over it brilliantly. It is the same for their disturbances of articulation. Give them a word difficult to pronounce, they fail; then at a moment when one expects it least they pronounce it without difficulty. From this come many surprises. We wish to demonstrate that a certain general paralytic always errs in counting money. He is asked to count twenty sous, and this time he does so correctly, without a single mistake. This is quite embarrassing for a demonstration. In a general way one can hardly foresee how such a one is going to conduct himself.



FIG. 22. MME. SOLAS. GENERAL PARALYTIC.

The second distinctive sign between the mentality of an imbecile and that of a general paralytic is furnished by the consideration of the intellectual level. It is in fact by relation to their level that one must judge of the importance of the phenomena of deficiency which they present. The errors committed by an imbecile are not surprising since his intelligence is so limited. On the contrary the

errors of a paralytic are at variance with his level. Thus Albert, an imbecile of five years, can not correctly name the colors; that is not surprising for it belongs to a child of five years; we have seen the paralytic, Colon, formerly a house-painter, call blue green, and yellow blue; these are errors which surprise us because Colon has a level of ten years; the error under these conditions is not justified by the level; it has an unusual character.

We could give here numerous examples of failures of general paralytics which have this striking character of being out of relation to their level, but we prefer to limit ourselves to one particular case and develop it fully. Here is the history of a patient whose intellectual level is still good and nevertheless what difficulties of functioning are perceived when she is closely examined!

Madame Solas is a woman of forty-five years who has a calm, serene, almost indifferent aspect. Her physiognomy is but slightly expressive. Her voice is weak, her gestures slow. Her speech presents the peculiar difficulties of articulation which are characteristic of general paralysis. To the questions asked her she replies with exactitude, with good sense, often even with witticisms; this indicates that the intelligence has held itself well; one would almost have the feeling that she is normal if precise tests did not prove her decay. We will let her talk a little.

Q. What is your name?

A. Blanche Gaudis.

Q. And your first name?

A. Blanche Solas Blanche. (She spells her first name.)

Q. And your age?

A. Forty. I shall be forty-five the 18th of February—forty-four at least. I am stupid.

Q. Why?

A. I was born in 66. (If she was born in 66, as it is now 1907, she would be forty-one. Already we have difficulties and errors of evocation.)

Q. Is it old or young to be forty-four years old?

A. What is that, monsieur?

A little psychic deafness.

Q. The question is repeated.

A. Oh, I don't know, it is enough for me.

Q. Would you like to be seventy-five?

A. Oh no! too old. What for? I couldn't.

Q. What couldn't you?

A. I could not be that old. I couldn't endure it.

Q. You would rather be dead?

A. Oh! surely.

Q. Were you young once?

A. (With a smile) Oh! I suppose—like everyone else. Here we have intelligent reflection.

Q. How old is one at twenty?

A. At twenty years? Twenty years. (The smile continues.)

Q. What has been your profession?

A. Embroiderer.

Q. How much does one earn at that trade?

A. I earned a living once.

Q. And now?

A. Now it is lost. Like all the rest.

Q. But how much money could you make at your trade of embroidery?

A. Three or four francs.

Q. By the day or the week?

A. By the day.

Q. How much did that make a week, three francs a day?

A. That made eighteen francs a week.

All this was correct.

Q. Were you married?

A. Yes, monsieur.

Q. What does your husband do?

A. He is dead. I am a widow.

Q. What did he do when living?

A. A hatter. (*Chapelier.*)

Q. He built chapels (*chapelles*) then?

A. A hatter I say! hats! You are making fun of me.

Q. No, I am a butcher, so I understand nothing about hats.

A. Well, its different.

Q. Your husband's name?

A. Peau.

Q. Did you have any children?

A. No, sir, I never had any.

Q. They are dead?

A. Yes, sir, they were dead when born.

Q. You have had two?

A. Ah! I only had one.

Q. What is the year we are in now?

A. I do not know, I hardly know how I live.

Q. Think!

A. Ah! I know nothing. I have no memory. (She makes no effort to remember; it is very singular that with the succession of reasonable answers which she had just given, she confesses to such a lack of orientation.)

Q. You have no memory?

A. None whatever.

Q. Why do you say that?

A. Because I see it, monsieur. I have noticed it more than once. I have none at all.

Q. What is it you forget?

A. Everything.

Q. Give an example.

A. For instance, my pocketbook. I would leave it on the table. Ten seconds later I would have forgotten where it was.

Q. And what else do you forget?

A. (With irony) Well, my head on my shoulders.

Q. You have lost much money in that way?

A. No, because some one took care of it for me.

These are characteristic disturbances of the memory, of evocation. They are conscious. The patient perceives them and passes judgment on herself.

Q. Your mother, is she younger than you?

A. No.

Q. Is she older?

A. She is sixty years old.

Q. Can a mother be younger than her daughter?

A. It is comprehensible. (She did not understand the question, and doubtless relied upon the reasonable tone which we employed in questioning her.)

Q. But can a daughter be older?

A. Ah! no!

The judgment is good.

Q. So you do not know the year?

A. Oh! faith, yes, we are in the year '99.

Q. Is it winter or summer?

A. It is summer.

Q. What month?

A. June.

This is nearly correct.

Q. Name the months of the year.

A. (She names them correctly.)

Q. That makes how many?

A. Oh, I don't know.

Q. Think again! how many months are there in a year?

A. 12.

Note this inertia; she knows but does not attempt to reply.

Q. Why are you here?

A. To take care of my health.

Q. In what way?

A. My nerves.

Q. Are you satisfied here?

A. Yes, monsieur.

Q. But there are crazy people here?

A. I do not believe it. There are some, but I am not crazy, not I.

Q. So it does not annoy you to be with crazy people?

A. That annoys me because I am very impressionable. (She speaks indistinctly.) I do not speak well.

Q. Still you are satisfied here?

A. Yes, monsieur, because I hope that you will cure me.

Q. What was your illness?

A. It was St. Vitus's dance, monsieur. I had it as a child from a fright.

Q. So?

A. Always impressionable. At the least thing, I cry without being able to stop. It is the same with laughing.

On the whole she is indifferent to her confinement, and there is a curious contrast between this indifference and this emotivity. In reality everything is alike to her; nevertheless she is easily affected. she weeps or she laughs at nothing. This seems contradictory, But in the main her tears and smiles are very superficial. This mental state is the rule with general paralytics.

She is very modest in appearance. Let us see if she has some vanity.

Q. You have nevertheless some special talents?

A. Oh! no, monsieur, I have none.

Q. You are not an ordinary woman?

A. Surely not.

Q. You were not bad looking once?

A. In my time, no.

Q. You were pretty?

A. I had like all young girls, *la beauté du diable*—youth.

Q. But something of it remains?

A. I don't know. For all that I could do without it!

Judgment very good. We did not succeed in arousing the least feeling of self-importance.

Here then is the portrait of Madame Solas. All her replies harmonize and are in good order; the mentality does not seem to be at all in ruins. In precise tests she shows the keenness of her intelligence. We ask her to define some words. Certain of her definitions are charming.

Q. What is a fork?

A. It is what goes with the spoon.

Q. What is a mother?

A. That is the best of all, ah!

Q. Justice?

A. Ah! it is great; and injustice, it is greater still.

A scholar would not disavow such replies.

Her manner of welcoming pleasantries indicates a clear mind.

Q. Is snow sometimes red?

A. Oh! no, it is white. I have never seen it (red) myself.

Q. What was the color of the white horse of Henry IV?

A. (Laugh.) What do you ask now, I do not remember, I never saw it.

Q. But what is there absurd in my question?

A. (Laughing.) Because it was red.

This was sufficient to give an idea of the intellectual level of Madame Solas. She is evidently not an imbecile nor even a moron. It is in relation to this mental level that we must judge her disturbances of evocation; these disclose a weakness that is truly astonishing. Thus she cannot count backwards; she says "20, 17, 19, 15" and can go no farther. We try again another day but with no better results. In the same way, although she knows how to count, she makes continual mistakes in counting money or pins. She counts 9 pins where there are only 8. A small sum of 19 sous (composed of a 50-centime piece, 4 two-sou pieces, and a 1-sou piece) is too difficult for her; the first time she counts 14 sous and the second 20 sous.

Another example. Several additions of two numbers of two figures each are proposed to her in writing; the pen is put in her hand and she is told to add. She is willing, but note closely how she performs the operation.

That it may be well understood we give the details; in the first addition she must add 59 to 73; the two numbers are placed one below the other, the line drawn and thus the way made clear. The patient places the figure 2 under the first column, she has therefore correctly added 9 and 3, finding 12, placing 2, but she must carry the 1; now she must add 5 and 7 and add the 1 carried over. This embarrasses her. She prefers not to attempt it and passes to the second addition. There she finds 52 to be added to 79; she adds the first column 2 and 9 and finds 11, writes 1; but there is here also 1 to carry over; a new difficulty; she prefers to leave this also and pass to the next addition; here a similar difficulty has been arranged, because the numbers were chosen so that there would always be something to carry; she gives this up after adding the first column and passes to the fourth example which meets the same fate as the other. Thus we find her four times in succession passing the difficulty by. One can therefore attribute to her this rule of conduct: "Nothing is impossible to man; that which he cannot do he leaves."

Her reaction times to sound—the last detail which we cite—are unusually long. She has apparently understood how she must respond but she reacts with extreme slowness; we have each time done our best to encourage her to go more quickly; her reaction times are about 50 one-hundredths of a second, while with a normal they are 12 one-hundredths; and when she tries to hasten the movement she only gives anticipated reactions. In this respect she is altogether inferior to a certain imbecile named Albert of whom we have elsewhere spoken; Albert has more difficulty in understanding the experiment but when it is understood his reactions are quicker and better.

Thus, as has been clearly shown, the disturbances of functioning which Madame Solas presents do not belong to her level; they are, so to speak, unworthy of her intelligence; this is one of the characteristics which these disturbances present among general paralytics and thus provide a means of distinguishing the failures and blunders to which imbeciles are liable.

3. *RESIDUES*. We must attempt to specify to some extent what constitutes the contrast which exists between certain defective replies of general paralytics and their level, which is higher or appears to be higher than their replies. The question is very complicated in itself and it is further obscured by all that we know of the nature of *residues*. We must remember that the dement differs from the imbecile by having a past of normal intelligence; and consequently we should expect that instruction and the varied information acquired by the dement would leave some traces in his conversation which would not accord with his present intelligence. These evidences of an earlier condition superior to the present are what we call *residues*. Alienists who question these patients are on the watch for residues which may serve to bring to light the differences which we note between the imbecile and the dement. Perhaps it will be thought that it is to the presence of numerous residues that we owe the contrast which we note among dements between their level and some of their replies.

This opinion contains indeed a part of the truth; but it must not be exaggerated; or rather we must take into account the quality of the facts which may survive from the earlier epoch.

We distinguish three elements.

1. Scholastic knowledge.

2. General knowledge of practical life.

3. The form of verbal replies from the point of view of grammar and of the vocabulary.

1. *Scholastic knowledge* is certainly most lacking among demented. We have taken the pains to study their reading, writing and arithmetic, not with any foregone conclusions, which unfortunately is too often done and which signifies nothing, but by employing two distinct known quantities; we first take their level of intelligence by means of our measuring scale; afterwards, with some very precise tests of instruction arranged by our collaborator M. Vaney, we examine these patients to see if they are equal in reading, writing and arithmetic to normal children of the same level.⁷

We expected that these tests would enable us to discover many *residues*. Our error was great.

It is in reading that they acquit themselves the best. Out of seven patients, five read as well as would be expected from their level; two are a year behind; one is two years ahead, a very exceptional fact; this is Beauchamp, the poor teacher who has fallen to the level of five years; in spite of her profound decay she can still read as one reads at seven years. But note carefully that what is best retained among these subjects is reading as an exercise of articulation but without the understanding of what they read. Thus we encounter several of these demented who read the selection correctly and fluently enough, but who can tell almost nothing of what they read; they are very inferior to normal children who read less fluently and less correctly than they, but who can retain many facts after the reading is over.

⁷ Since at the present time we are working for the clinic we think it profitable to reproduce the table of tests serving as a measure of the degree of instruction, in order that the clinician may have at hand all that is necessary for him to apply this measure. The table that we give has been devised by M. Vaney; we have already published it in our book *Enfants Anormaux*.*

* *Editor's Note:* English translation *Feeble-Minded Children*. Published by Longmans, Green & Co., New York.

Reference Table of Pedagogical Examination

AGE OF THE CHILDREN	DEGREE OF READING	ARITHMETIC TYPE PROBLEMS TO DICTATE	ORTHOGRAPHY	
			Mistakes of spelling and grammar	Type sentence to dictate
From 6 to 7 years	Syllabic	From 19 apples if one takes 6 apples how many will remain?	16	"The pretty little girls studied the flowers which they gathered yesterday"
From 7 to 8 years	Hesitating	Subtract 8 sous from 59 sous.	11	
From 8 to 9 years	Hesitating fluent	From a case of 604 oranges 58 are sold. How many remain?	8	
From 9 to 10 years	Fluent	It requires 7 meters to make a dress. How many dresses could be made with 89 meters and what would be the length of the remnant?	6	
From 10 to 11 years	Fluent-expressive	A workman earns 250 francs in the month of February which has 28 days. He spends 195 francs. How much did he save a day?	4	

Writing from dictation, judged by the orthography, is always faulty. The number of errors of spelling and grammar is not at all that of children of the same level; there is a retardation of at least a year and much indulgence is required to record only this difference; it is only by disregarding the numerous lapses which they commit in writing.

The retardation is still more accentuated in arithmetic; we have studied this by means of the extremely simple problems of the table of M. Vaney; the problem of the apples is a limit very rarely

attained. Out of five patients studied with the greatest care we observed in one a retardation of one year, in two a retardation of two years, and in two a retardation of three years. Thus Colon, who has the level of ten years, is absorbed for a minute and a half in solving the problem, "If I have 17 apples and I eat 8 of them, how many are left?" And he finds 8 apples.

The conclusion to be drawn from all this is that, if we employ the method which we have just indicated and which consists in first fixing the intellectual level by a group of tests and then comparing the scholastic knowledge of the dement with that which normally belongs to his intellectual level, we find a marked retardation especially for scholastic problems. This is therefore the exact opposite of residues. Perhaps some one will object to our manner of proceeding; and, while admitting that it is superior to the empirical method of certain alienists, who, struck by the cleverness of a reply, say from intuition "There is a residue!" will perhaps object that our procedure is conventional and consequently artificial. Everything depends, he will say to us, upon the way in which you fix the level; if for example you fix it by means of the remnants of instruction that are observed among the patients, all the other tests would be residues; indeed, if a dement is two years retarded in arithmetic, and if you fix his level by that test alone, the result would be that he is advanced for a host of other tests. That is true, only we believe that such a convention would be open to criticism; it seems to us decidedly preferable to fix the level by a group of tests, by the greatest possible number of tests, and by those as varied as possible; this is what we have done and in so far as we are right in so doing we maintain that the instruction in reading, writing or arithmetic would never constitute a residue.

And now one last remark; if reading is better preserved than writing from dictation, and this again better preserved than arithmetic, it is because it contains a greater part of automatic activity. We have noted this singular fact that a dement may read as easily and as fluently as a child of the same level, but he does not understand nor explain his reading nearly so well; it is the difference between an automatic memory and an expression of intelligence. These patients are weak in arithmetic because we demand of them the solution of problems, that is to say an exercise of the judgment and not of the automatic memory. By taking another

direction and demanding more of their automatic life we should have different results. Thus, certain dementes still know their multiplication tables very well; but when memory fails and they try to conceal this lack the errors they make are fantastic. Samse, seven year level, replies thus to our questions.

QUESTIONS	ANSWERS	QUESTIONS	ANSWERS
2 and 2?	4	12 and 12?	24
3 and 3?	6	12 and 13?	16
5 and 4?	9	13 and 12?	15
9 and 17?	14		

The reply 12 and 12 makes 24 is automatism; while the reply 12 and 13 makes 16 is an expression of intelligence in which the subject remembers nothing; this is evidence of what she does when automatism fails her.

Holeg, level of nine years, shows the same contrast in a still more obvious manner.

QUESTIONS	ANSWERS	TIME
		<i>seconds</i>
3 times 3?	9	
6 times 6?	36	
5 times 7?	35	2
8 times 7?	42	2
7 times 9?	36	2
7 times 9?	63	3
8 times 5?	40	1½
3 times 9?	27	2
8 times 8?	48	2
8 times 8?	16	2
No! 8 times 8?	48	2
No! 8 times 8?	16	
No!	8 and 8 are 16	
But 8 times 8?	48	
No!	What?	
8 times 8?	Oh—4 times 8—8 and 8—16 and 8—24 and 8—32	
And then?	8 and 8—16 and—13 and 8—24—and 8—32 and 8—12 and 8—50	
No, not 50!	52	

The example is clear. Having lost the memory of $8 \times 8 = 64$ this patient cannot multiply 8 times 8 and when he tries to do so to repair his failure of memory he commits enormous errors. Here is a curious contrast between automatism and an expression of the intelligence. We terminate therefore this part of our work with the conclusion that their automatism when it is retained is always above their intelligence.

2. *The knowledge of practical life* has given rise to the same illusion; to our surprise, we confess, we have not found residues here or indeed but rarely; and the proof of this is that the dement compared to an imbecile or to a moron of the same level has no greater general knowledge.

We cite the example of a woman Vigne, who has a level of nine years, and in whom one might expect the conservation of a mass of ideas. She has become very ignorant and does not know how to reply even when asked very easy questions of practical life.

Q. Where were you born?

A. At Strasbourg.

Q. What is your fatherland?

A. I am French.

Q. What is the capital of France?

A. (She limits herself to sticking out her tongue. She does not even know the capital of France. Extraordinary ignorance!)

Q. What is the capital of France?

A. I do not know.

Q. What is it you do not know? (Because we are wondering if she understood the question.)

A. The capital of France.

Q. And the government of France, what is it?

A. You ask me too much.

Q. Is it a kingdom, a republic, an empire?

A. You ask me too much.

Q. Is there a king in France?

A. No.

Q. An Emperor?

A. Yes.

Q. What is his name?

A. I do not know.

Q. What river flows through Paris?

A. The Seine. There is a place where it is low.

Q. Did you know Carnot?

A. I have seen him in a book.

Q. How did he die?

A. I have seen his tomb in a book.

Q. Yes? How did he die?

A. I do not know.

Q. And Victor Hugo was——

A. Victor Hugo is also dead.

Q. But who was he?

A. Victor Hugo was——Ah, I forget.

Q. Did you know Pasteur?

A. A pastor, yes.

Q. What did you know of Pasteur?

A. A pastor is a man who is intelligent.

Q. Have you ever heard of Louis XIV?

A. I knew Louis XIV, but——

Q. Charlemagne?

A. Yes.

Q. Who was Charlemagne?

A. An interesting man. I ought to know much about him; I have read that in books.

But where are her school memories? Where are the snows of last year?

Q. What is the capital of Italy?

A. That I don't know.

Q. What is the Pope?

A. The Pope is the king of all the world.

She lived five years in Hyères, her husband worked at the Seyne.

We ask her.

Q. What is the sea called at Toulon?

A. There is a sea at Toulon, more or less high; sometimes it overflows, and destroys the houses; it goes all the way to Hyères.

Q. But what is it called, the sea that bathes Toulon?

A. The sea of Toulon.

Let us question her further.

Q. How much does it cost to send a letter from Paris to Marseilles?

A. Oh! I never sent a letter from Paris to Marseilles.

Q. And from Paris to Toulon, how much does that cost?

A. A letter from Paris to Toulon does not cost much, not more than 5 sous.

Q. How many minutes in an hour?

A. 12.

Q. How many days in the year?

A. There are thirty days in a month.

Q. But in a year?

A. Oh, I would have to count that. (She recites the months.)

Q. That makes?

A. 10 and 3, 13 months, isn't it?

Q. But how many days?

A. Ah—I'd have to count that. I'd have to count by 30.

We deem it unnecessary to make her perform this calculation.

She can no longer recite to the end, "Our Father who art in heaven." Nevertheless, she is not absolutely ignorant; she knows what a dozen eggs cost, a pound of lard, a cutlet, and also where wine and milk come from; she describes fairly well how one fries an egg.

When one realizes that for thirty years she lived the social life of the world, one can judge of the actual poverty of her ideas. She has no more memories than a moron, for instance Griffon, whose history we have given in a previous article upon the intelligence of imbeciles (page 120). In order to be able to judge the value of the practical knowledge of demented we must compare them with imbeciles or morons and not with children of the same level; because imbeciles like demented have had a long past life and in consequence have had an experience which is lacking in children.

3. THE FORM OF VERBAL REPLIES. If residues of memories do not exist, one must not conclude therefore that all residues are absent in the psychic life of demented; one could not draw such a conclusion because it would be directly contrary to clinical experience. Every experienced clinician when in the presence of a demented has had the impression that his mentality is not the same as that of a moron, that it is richer, nobler, more impregnated with traces of a previous normal life. This impression cannot be ignored; since it rests upon long experience it must contain some truth. After much reflection we have finally reached the following conclusion. Residues certainly exist among demented and they contribute to the production of the contrast, which we have so strongly insisted upon, between their lapses and their level, but we must not search for them where they do not exist. They never result from an expression of the intelligence consisting for instance in making a clever remark or in expressing a judicious judgment or, still less, in solving a problem; nor do they consist in conscious memories whose application would demand some intelligence; they consist in the shade of expression and gesture, the form of language, the turn of a phrase, the choice of words which are in harmony with a rather high intelligence which today is lost. As a result of this we, the observers, meet with a host of slight perceptions more or less conscious, often badly confused, which reveal the contrast between what the

dement actually is and what he once was. We could cite certain sentences of a dement the nobility of which has the odor of a normal life and of which an imbecile would be incapable. It is not then by the content of their replies that the dements prove that they have residues, it is rather by the form, so far at least as one is able to separate the word from the thought because the whole is bound together. In general a common thought is not clothed in noble words.

Thus Beauchamp, who has the level of five years, when asked the trade of her husband cannot surpass the childish and imbecile formula *he works*. But a few seconds later she gives to another question this remarkable reply, "*I do not know what it is that you wish me to say.*" It is clear that no child of five years unless it were very precocious would ever construct sentences in so complicated a manner.

Another dement, generally very taciturn, the one who was taken by an expert alienist for an imbecile, replied to the question, "Are you beautiful or ugly?"—"You see very well how I am!" And another time she said to us, speaking of her past, "*I was very beautiful, I assure you.*" This form of language is superior to her level which is only that of four years.

Samse, a paralytic of the level of seven years, also makes reflections whose verbalism is quite superior.

Q. You have not received any treatment?

A. Oh, no, *only* I take wine, *good* wine *that* the doctor has ordered for me. So *when* I leave here, I shall go and buy a quart, because it is good for me. *It comes a little dear, but no matter! When one needs care!*

We have put in italics whatever in her reply has seemed to us somewhat superior, the *onlys*, the *thats*, the *whens*, these words are as it were the aristocracies of language.

Vigne, whose level is nine years, tries to arrange five boxes in the order of their weight and during the task makes reflections that are worthy of note. "They seem to be all of *the same weight*. Ah! no—this one—They must be nearly equal. *I do not believe that I am much mistaken. But it is quite difficult inasmuch as the difference is slight*, especially weighing them thus in the hand." Again we put in italics what seems to us of a style superior to her level.

Philomène, of the nine year level, abounds in sentences which are striking because of their elegance. Speaking of her past

existence she says, "It is *quite a romance, my life!*" Describing a picture which represents an old man seated on a bench she says, "*Oh! that white beard; how beautiful it is, how respectable!*" After reading for us the story of a fire started through carelessness she said, "I cannot understand why anyone should not take more precaution than that." Another time, after having described with much boasting the talent she had for dressing the hair and for combing out the tangles she said, "And gentle above everything else with so much care and gentleness! Separate the hairs almost one by one with *infinite* care without annoying the person, etc."

Perrot, another woman of the level of nine years of whom we ask what is charity, replies, "What is it that you wish me to say? It seems to me that any one who exercises charity does well, because there are so many unfortunates! You should exercise it too,—and look after some poor people." When we have her count some sous on the edge of the table she makes this superior reflection, "This is really child's play!"

After these examples we can do no more than give our feeling because we have not made the necessary studies of the evolution of language which would permit us to affirm the age to which each grammatical form corresponds. We shall supply this lack when we are able.⁸ For the moment we must be content with saying that in the thoughts, the locutions, the choice of words and the syntax of paralytic dementes we find very many residues, which consist especially in automatic memories; they are skeletons from which the conscious life has withdrawn. With this point which presents some practical interest we conclude by saying that the inertia of functioning which we observe in general paralytics is especially recognized by the contrast which exists between their failures and their intellectual level in so far as one can accurately measure it; and, furthermore, their intellectual level appears to be higher than it really is because of the presence of residues, which consist in the verbal form of their replies rather than in the content.

4. INSUFFICIENCY OF DEVELOPMENT OPPOSED TO INSUFFICIENCY OF FUNCTIONING. It remains for us now to go a little

⁸ It is supplied. One of us has just finished a study on the language of children (A. Binet).

farther and having explained what a disturbance of functioning is, to contrast it with a lack of development. For this we shall speak mainly of imbeciles. Let us employ first of all some metaphors.

Let us take a watch. In the mechanism of a watch there are two things to consider: first, its degree of complexity; a certain watch indicates only the hour, another indicates the hours and minutes, another adds to this the seconds; second, we must consider the functioning of the watch, that is to say the regularity of its movement, its rapidity, the length of time it can go without being wound up, etc. It is this distinction, which is so clear for a watch or any piece of mechanism, that we are attempting to apply to an intelligence, because it seems to us to be a very convenient illustration by which to express the essential difference which exists between an imbecile and a general paralytic, and the numerous points in which the two resemble each other. The imbecile has an intelligence but slightly developed; it is, as it were, a rudimentary watch which indicates only the hours, but, so far as it goes, this intelligence functions well; every time this intelligence fails before a problem it is through lack of development. On the contrary, with the general paralytic it is always the functioning that is at fault, that is to say the intellectual work. Theoretically, this dement must be considered as an intelligent man who can no longer use his intelligence and whose intelligence betrays him at every moment.

From this point of view, the distinction between the imbecile and the dement is therefore very clear. But exactly what is the development of the intelligence? In what does it consist? Certainly in many things; he would be very daring who tried to define such a complexity with a single word. But we can state what seems to be the most important trait in all mental development and what seems on the contrary the accessory trait. In addition we may note the tendency to organization which is undeniably weaker in the child than in the adult; witness the inconstancy of the desires, the caprices of ideas, the lack of continuity which we find in a young child. Follow in the street a little school boy going to school and compare the path he follows with that of an adult; the adult goes more or less directly to his destination while the child takes a zigzag course which shows the insufficiency of his direction and control. Here then,

in our opinion, is one of the traits of mental development; it produces a better and stronger organisation and consequently it is to be expected that young subjects, who are not yet completely developed, should show signs of a weakness of organisation; in this way they must of necessity slightly resemble general paralytics in whom the insufficiency of direction and control also manifests itself, but as a sign of disorganisation and not as the beginning of organisation. There is not, however, with the child any lack of evocation but rather lack of coördination, through the pullulation of ideas and of heteroclitic sentiments.

But that which especially and essentially characterizes a mental development is the process of differentiation. If one refers to our chapter upon the Scheme of Thought, which we have included in our more extensive study of the mental development of imbeciles⁹ he will find there the law formulated and described according to which a thought develops; it is by the progressive passing from the simple to the complex, from the indefinite to the definite, from the accessory to the essential, a progress thanks to which the thought adjusts itself better and better to its end. The development of intelligence manifests itself therefore in the quality of the states of consciousness. Of two states of consciousness that one is of superior quality which is less simple, less commonplace, less vague, less indeterminate, more definite, more rich, more special; or rather, to take a broader view, the superior state is that which adapts itself the best, the most completely to its environment; but for the adaptation to be as perfect as possible the thought must reflect at the same time that which is special and essential in the environment in which one acts. A curious experiment that we have often tried with children of all ages, adults of every social condition, imbeciles and morons of every level, and general paralytics of every degree of disorganisation shows admirably in what this development consists. We refer to the comments upon pictures. We place before an imbecile and a general paralytic a picture representing two old people in want, stranded upon a bench; one of them is an old man with a white beard and eyes closed; the other, a woman, is leaning against him. An imbecile is satisfied with the response, "*It is a man.*" A general paralytic, impressed no doubt by the

⁹ *L'Année Psychologique*, Vol. XV, 1909, p. 122.

head and beard of the man, makes this reflection, "*One would say Victor Hugo.*" Who would not perceive the abyss between these two responses; the thought of the imbecile is almost indeterminate; would apply quite as well, not to say quite as poorly to an immense number of different pictures. It would be well to recall here that we made a collection of some fifteen reproductions of paintings which we showed to our imbeciles and for these pictures they have almost always made the same reply, "It is a man—Those are women—That is again a man—And then that is a woman, etc." It would be impossible for one to reproduce the picture from such commonplace indeterminate comments. On the contrary the reflection which compares the old man with the white beard to Victor Hugo is much more complex, much more special; it would apply only to a very small number of pictures. There is here the character of specialty which we consider one of the qualities of intellectual development. A second character is that of representing what is essential in the reality. Here again the comments upon pictures furnish us with many examples. Many children looking at the pictures are struck by some insignificant detail; they designate first, for example, the branch of a tree instead of the active persons and thus subordinate the principal to the accessory, the whole to the part; in the same way dull intelligences take only the immediate appearance of the reality and neglect what they do not see but what is nevertheless of infinitely greater importance. Much might be said upon this subject.

Combine these two qualities of the states of consciousness and we see that they assure an adjustment of each state of consciousness to its own end, that they thus make the theory of adaptation enter into an exact conception of intelligence, and that we arrive at a very clear and very satisfactory idea of intellectual development.

In opposing thus the quality of the states of consciousness with their evocability¹⁰ we make a distinction between the develop-

¹⁰ For those who are seeking some synthetic views, we recall that the quality of the states of consciousness or the development of the intelligence depends on two factors, invention and judgment; invention corresponds to the complexity of the states of consciousness and judgment to their exactness. But we have seen on other occasions that there are two principal intellectual types, the observational and the imaginative, which

ment of the intelligence and its functioning, and at the same time between the mentality of the imbecile and that of the paralytic; the mentality of the imbecile is composed of simple states of consciousness which are evoked with normal facility; the mentality of the paralytic is composed of states which are more complex but which have become difficult of evocation.¹¹

5. FOR THE CLINIC. We have thus examined our problem placing ourselves first at the theoretical point of view of the psychologist, then at the practical point of view of the physician. It is at this latter point of view that we again place ourselves to ask if the description we have made of the *slight psychological signs* of dementia¹² and the theories which we have drawn from them have contributed to the diagnosis of dementia and how far.

It would seem that we have reached a conclusion which, setting aside the difference of language, is equivalent to saying that the paralytic dement presents a *weakening of the whole intelligence*; but this is also the conclusion, or to put it better, the quintessence of the classical theory. First let us say in what way we are in perfect accord with this theory, then we shall state how we believe we surpass it.

In accordance with the classical theory we admit that the are distinguished by the predominance of the judgment or of the imagination (see A. Binet *l'Étude Expérimentale de l'Intelligence*). Thus all of those studies hold together and lend mutual support to one another.

¹¹ It is important to define here the point to which we have arrived. Nearly all our study has been made in an office through which the insane patients pass; we have been able to study these patients only during brief sittings in a consultation room; we have summoned them there for certain tests of intelligence; we have not had the means of observing in them the spontaneous phenomena which occur in the life of the asylum and which are the manifestation of their emotivity and of their character. Consequently our analysis bears solely upon the functioning of their intelligence. In order to complete it other studies on their character would be necessary. We hope soon to have the opportunity of completing it in another hospital; and even at the present time we believe that we see the exact point where additions will be made; but we are not willing to present any theory without sufficient records and hence, we prefer to postpone the exposition of our views.

¹² It is a fact that the slight psychological signs that we have described have been noted more or less by writers; only they present them in commonplace inventory, without giving them any other connection than that of co-existence, while we have sought to classify them, to interpret them, and to make use of interpretation for perfecting their analysis.

✓weakening of these patients is *global* in character; but if we admit it, it is because we have demonstrated it by very different means. For clinicians the disturbance is *global* because it is manifested in all the functions, memory, attention, judgment, etc., by means of observations in detail but without connection one with another; and because one makes in a way an addition of all these disconnected observations and one sees that in the dement none of the faculties is spared, none functions normally. For us the disturbance is *global*, because we see that it results from a certain mode of functioning, always the same, which is found in the whole intellectual activity; for us it is an affair of psychological analysis and not an accumulation and a generalization of particular observations; it is, in a word, because dements have a disturbance in evocation and because evocation is the basis of all intellectual work that these patients seem to be affected by a general weakening. It results from this that our interpretation is much more flexible than the classic; it permits the conception of other forms of *global* dementia, but they will not be so in the same manner as paralytic dementia, dementias for example where the different intellectual functionings are all affected but unequally in degree or differently in quality. It can thus be seen that we give to this expression of *global* a new sense.

The same remarks can be made in regard to the term weakening. One believes that he understands this word and it seems precise and sufficient, until he takes the pains to analyse it. The analysis which results from the classical theory is extremely
✓incomplete; by intellectual weakening of general paralytics we understand simply a group of errors of memory, of judgment, etc., but there are indeed errors of many sorts; those of general paralytics are not those of epileptics, not those of senile dements. It is true that we say that the errors of general paralytics indicate a demential level. But is this true? The errors of general paralytics seem rather in contrast than in accord with their level of intelligence. When the patient Philippon, who has a level of nine years, cannot tell the date and we suggest to her, "It is perhaps the 50th" and she replies, "Perhaps it is," the error has not its *raison d'être* in the demential level of her disease. Philippon is not so low grade since she still retains a level of nine years. We think the error can be explained by a defect of functioning and the absence of evocation; the number 50 has not evoked

the precise and appropriate idea and consequently has not been judged. And it is this defect of functioning which characterises the errors of these patients.

The novelty of our point of view in the use of the word weakening can be very easily seen if one recalls the discussions that daily occur in cases where the diagnosis of general paralysis is doubtful. It seems for these authors that the intelligence is a quantity and that the weakening is only a diminution of this quantity. Thus one often hears this objection to a diagnosis, "But this patient has memory! See all the information he can give. Now listen to the reflection which he makes; it proves that he is not lacking in judgment." It would seem that these objections were correct. When a patient furnishes exact information as to his trade, his income, his first entrance into the asylum, or recalls some event that you yourself have forgotten and which you are obliged to verify, one may recognize in him a general paralytic, but it is not by virtue of the conception which these authors have formed upon the subject of the weakening of the intelligence, because the conservation of the attention, of judgment, of memory, is incompatible with this conception. On the contrary our theory puts us completely at our ease with these embarrassing facts. Dementia is not characterized by a lowering of level and the lowering of the level is not sufficient to constitute dementia; one does not speak of dementia in melancholia although the intellectual functions are very much diminished. The intelligence of the general paralytic is lowered, disturbed, by accidents which manifest themselves in his functioning, accidents which constitute veritable defects. There does not exist in the beginning, for instance, deterioration of judgment, but faults of judgment, repeated accidents, blunders. The inertia of functioning is in the beginning only accidental, hence the contrast with the whole of the personality; it occurs at intervals very irregularly, and of course it manifests itself particularly in difficult and complicated cases which demand effort, care, attention to detail; for the diagnosis to be established it suffices that one of these characteristic defects manifests itself clearly. By the repetition, the multiplication of these defects, we have a lowering of the level, because these defects interfere with and consequently diminish the output of the individual. Compared to each other the imbecile and the dement are

like two poor walkers who have different reasons for not going a long distance, the imbecile because he has very short legs, the dement because he makes false steps and is constantly falling down. That which dominates the whole question is the mechanism of the errors produced by the dementa. We replace the old conception then by a conception that is more precise. The old conception, according to which the demential states depend upon a quantitative diminution of the intelligence or upon an injury of all the faculties, was a constant source of confusion. One had indeed the impression that there was something besides this; but whenever the diagnosis of dementia was doubtful, or when one attempted to determine exactly the constituent elements, the ground that he believed solid gave way under his feet. To the vague and inexact affirmation of a *global* diminution of the whole intelligence must be added, and even substituted for it, the conception of individual errors of functioning, of defects of every sort, which by their multiplication lower the intellectual level and which present the two following characteristics: irregularity and extensiveness relative to the level of the subjects.

IV. DISTINCTION BETWEEN IDEATIONAL INTELLIGENCE AND INSTINCTIVE INTELLIGENCE

1. PORTRAITS OF TWO SENILE DEMENTS. Serious objection could be made to the theory of paralytic dementia which we have just set forth; or to put it better, we shall make some observations which at first sight seem to contradict the preceding theory, but which on the contrary when rightly interpreted will support it and will permit its meaning to be enlarged.

We allude to a whole category of patients, the senile dement, who present extremely accentuated disturbances of memory and consequently of the faculty of evocation, and who nevertheless have not at all the same mentality nor the same attitude as general paralytics. Instead of making a clinical table of senile dementia let us observe a patient, make her talk and submit her to different tests which show all the consequences of the amnesia with which she is affected.

We present to our readers an old woman who seems to be sixty-five or sixty-six years old; she is small, thin, with slightly anemic skin and delicate features. She is quite lively, her expression is serious and attentive, she has even an intelligent glance which meets ours directly. This lady is not without good manners. She says good morning on entering, seats herself on a chair and awaits our questions in a polite manner. She at once gives the impression of a reasonable person and her conversation from the start confirms this impression. She shows neither familiarity nor lack of tact. The social sense is well preserved in her. Her air of dignity and of circumspection would pass very well in a waiting woman of a public building.

Already this attitude permits us to understand with whom we have to deal; she is not an imbecile nor a paralytic. But this is perhaps only a deceptive appearance; perhaps also the correctness of her attitude is only a residue of a former state, the well preserved façade of an edifice in ruins, such as one might expect to find in dementia patients. We must not therefore stop at these exterior signs. Let us make our patient talk.

Her conversation when followed for some time astonishes us. We commence, according to our custom, by giving general questions; we ask her age, her profession, her family, her past life. It is impossible to obtain a single precise reply or any trustworthy information. Facts that are of prime importance she declares she does not remember; for others her explanations are not at all clear, they are even contradictory. Let us see.



FIG. 23. MME. MACOLARD, SENILE DEMENT, PRESENTS HERSELF WITH AN AIR OF GREAT DIGNITY.

Q. What is your name?

A. I am called Mme. Macolard.

Q. What is your age?

A. Oh! monsieur, I am not young—oh! no!

Q. But what is your age?

A. Seventy-two or seventy-five years.

Q. Are you from Paris?

A. Ah! no, I am from Clermont.

Q. What is your profession?

A. (Pointing to Dr. Simon who is writing.) Well my profession—to do what that gentleman there writes. (Impossible to know what she means to say.)

Q. You were in business?

A. Yes, in business, the hardware business.

Q. What did you do in business?

A. We made the circuit. We did it, it was very well. (Confused explanations, numerous details that no one could hear or understand.)

Q. You have had many children?

A. I was the only child.

Q. You have not understood. I ask you how many children you have had.

A. It would be hard for me to tell.

Q. Why so?

A. Because I do not know exactly.

Q. Let us see, explain yourself. Have you had more than one?

A. Oh! I should say. I have had more than four since I came here. (Unintelligible.)

Q. Have you had ten?

A. You would not wish it.

Q. Less than ten then?

A. Oh! I think so.

Q. More than five?

A. Oh! surely five. Because one must come and go.—I would not tell you that I had less than five.

One can already see from these few words how her memory has gone. There are singular omissions and obscurities in her replies. Note now some contradictions.

Q. Your mother is still living?

A. Oh! yes, monsieur.

Q. How old is she?

A. She is younger than I.

Q. She is not your real mother then?

A. Yes, my real mother.

Q. You say she is younger than you?

A. Once she was younger than I.

Q. But now she is older?

A. Since Monsieur (pointing to Dr. Simon) is younger than I—well it is the same thing. (Unintelligible.)

Q. You have told your age?

A. Oh! yes, monsieur.

Q. Tell me again. What is your age?

A. Perhaps sixty, sixty-five. How much I do not know.

She had said seventy-two or seventy-five a moment before.

Q. And your mother, what is her age?

A. Mama is older than I. Very often she stays in the country.

Q. How old is she?

A. I do not know—If it was read—(pointing to Dr. Simon who writes)
If that page that is being written were read—

Q. But you said your mother was younger than you?

A. Oh! she is not younger than I. She is about like me, my age.

It can be seen how contradictory are the words of this woman since in an interval of five minutes she affirms that she is older than her mother, then that she is younger and finally that they are of the same age. But in reality it is because she has no pronounced definite convictions about the words she uses. She contradicts herself because she forgets the sense of the phrase which she has started and also the end which she has in view while speaking. Obviously none of these contradictions would be encountered in a conversation with imbeciles.

The memory of Mme. Macolard presents in fact a very accentuated weakening. That which is conserved in her is the use of language and that which constitutes knowledge not memories; for instance, reading (she reads quite fluently), writing, the knowledge of money, the names of colors, etc. But for whatever concerns recent acquisitions she is deeply stricken. It may be said that she has *knowledge but not memory*. Thus she cannot find her bearings from any point of view; she knows neither the hour, the day, the month, the season, nor even the year.

Q. What day is today?

A. I do not even know anything.

Q. Is it afternoon or morning?

A. Ah, indeed, I do not know.

Q. Try to tell which it is, afternoon or morning?

A. It is still morning.

Q. And what morning? (In reality it is five o'clock in the evening.)

A. You have asked me too much.

Q. What did you eat this morning?

A. Ah! it would be very hard for me to tell you.

Q. What month is this?

A. I know nothing about it.

Q. Oh! yes, tell me what month it is?

A. Is it the same as you?

Q. Yes.

A. If it is the same we are equal. (Happy way for her to escape.)

Q. This is December! (In reality it is May, it is warm, the fruit trees are in bloom.)

A. That surprises me. December and January. We are not in the month of January. It is possible.

Q. What year is this?

A. Faith, I know nothing. What year did you say it was?

Q. 1809.

A. 1809, that is nothing.

Q. And do you know who just died? Louis XIV.

A. I have heard of him.

We shall not attempt to characterise this forgetfulness as lack of attention. When the memory is affected to this degree it is evident that the attention must be also affected. It forms a complicated mass of disturbances. What seems to us certain is that the great loss comes in the memory; not to know the year in which one is living cannot come from a falling off of the power of attention; not to know if it is morning or afternoon cannot come from a lack of attention; however weak the attention the meals are noted. These lapses come from loss of memory.

Let us proceed to a methodical study of her memory, by way of experiment. She can repeat four figures; she attains occasionally this maximum of four. Out of thirteen pictures shown her she does not remember a single one. All that she can do is to repeat a sentence of eight syllables. We give her three simple commissions. She understands them very well but the moment she rises to perform them she is much embarrassed. The three commissions are as follows: to carry a music box to another table, to take a flower from a bouquet and bring it to us, to move a chair. The dement rises, saying, "Well, I must take the bouquet." She goes to the table, looks at the bouquet, "I am to take only one flower." She is deeply embarrassed, turns to us, looks at us, seeking to implore our assistance. But we remain as immovable as sphinxes. She decides to pick a flower. Her embarrassment continues. "Perhaps I must not bring it——" She lays it on a chair and comes back to her seat without any concern as to the commission she has forgotten. Such a loss of memory renders her completely useless.

Nothing shows us more clearly the fugitive character of her memory than the experiment with cards. We present to her two cards and ask her to name them; then we conceal the two cards and fifteen seconds later, which is a very short period, we ask her to name the two cards; she has forgotten them. Since

we did not succeed with simple cards we show her some face cards, the king of diamonds and the queen of clubs. Thirty seconds are used in showing and making her name the two cards. She is very attentive. Then we turn them over on the table and ask her to name them after allowing exactly fifteen seconds to pass.

Q. Well? What were they?

A. But I did not see. They were red on the back. I did not want to raise the other.

Q. Yes, but what did I show you?

A. You showed me—I am not sure that one wasn't the six.

Q. And the other?

A. Turn it over—You only look at it yourself.

We begin and show her the same cards and again we allow fifteen seconds to pass.

Q. Well now, this time you are going to name them.

A. King of clubs—and the Queen—perhaps of clubs also or of spades—I only glanced at them. (It is her habit always to complain.)

It can be seen with what difficulty we succeed in giving her a trace of memory which probably did not endure more than two seconds. This is however one of the easiest experiments with memory that could be made. That is the reason we use it in senile dementia. In paralytic dementia we employ a more difficult test, that of the three figures, Ernest, Louis, Antoine. But it would be out of the question here for it would be too difficult for our patient to retain. Let us conclude with an incident. While Mme. Macolard is with us we send for Denise, an imbecile whose presence cannot escape notice for she laughs aloud incessantly. Denise remains a full quarter of an hour with us; Mme. Macolard often speaks to her to admonish her, telling her to be quiet, etc. The scene is not devoid of humor. Mme. Macolard has received from us a paper with the request to read us something. She consents but she has the habit of not being able to decide; she always finds that something is wrong, she turns the paper in every direction. Denise near her laughs loudly. The dement is offended at her laughter, and addresses a reprimand full of feeling to Denise, "Mademoiselle, do not laugh; you must be more *respected*." If certain words are inexact the tone is there. The imbecile, impressed, quiets herself. The dement goes back to her paper. She complains that she cannot see.

"With glasses," she says, "I could see all right." Seeing that we wear glasses she says to us, "But you have them, then you read," and she hands us the paper. We refuse it. This excites a new burst of laughter from the imbecile and the dement reprimands her again, "My dear, you must not laugh like a child of three." The scene lasts quite a while, after which the two women are taken into the garden to be photographed; this took a long time because we took three photographs of one and two of the other and the poses had to be arranged. All then returned to the office and after a little while Denise was allowed to go.

A half hour after the imbecile had left us we questioned Mme. Macolard about the affair.

Q. Did any one come in here with us?

A. Not that I know of any way.

Q. We three have not been alone all the time? Think. Besides we were not in this room all the time.

A. (In substance she says that once we went out together.)

Q. Are you sure that we opened that door?

A. I think so. (It was by that door that we had gone into the garden.)

Q. So no one came in since we have been here?

A. But we have not been here long.

(In reality we had been there at least two hours.)

Q. You do not remember to have seen a patient enter here?

A. Ah! a patient who could not stand up.

Q. Madame, a patient did come in here!

A. Yes. I do not know. I say yes, but I do not know.

Q. A patient came in here!

A. Here? You have scarcely had any patients this year. (Unintelligible.)

Q. It was a patient who laughed all the time.

A. That stout woman who came here! She did nothing but laugh.

Q. You remember her then?

A. Yes, monsieur, it was easy to remember her. She sat here on this chair, and then she laughed with her fat face. (Correct, the imbecile has a fat face.)

Thus it can be seen with what difficulty we awaken in her this very striking and very recent memory.

It is certain that so great a psychological disturbance must produce many repercussions in the mental stage of the patient. The principal repercussion that became visible during our examination was besides the loss of memory the inappropriateness of language. This dement had great trouble in naming

familiar objects shown to her. A gas jet was called a lamp; a wash basin was called porcelain or a thing to wash in; a water pitcher received this picturesque appellation, "It is one that waits for water to be put in." The expression of ideas suffers from this poverty of words and the patient, as one can see from the bits of dialogue which we have given, often uses unintelligible phraseology or affirms facts which a few minutes before she had denied. This comes from incoherence of language much more than from incoherence of ideas.

But let us examine the effect which the amnesia has had upon the judgment of the dement. Does she commit gross blunders? Does she accept without any critical sense the enormities that one affirms before her? Has she lost the sense of the ridiculous? Is she suggestible to a supreme degree? Already it has been possible to note a certain ironic turn in her sentence; whatever the value of this irony it is evidently of a quality that would be impossible in an imbecile. Mme. Macolard is not devoid of wit. Once we asked her to make some mental additions; she could not perform them but neither did she satisfy herself as would an imbecile by replying at random.

Q. How much does 9 and 8 make?

A. Very well, 9—How much does 9 and 8 make?

Q. Answer first, I will tell you afterwards.

A. Very well that will be time enough.

Notice also that she never replies haphazard as would an imbecile; when she does not know she does not reply at all and declares she does not know, which is very sensible on her part. On the whole her memory is extremely weakened but her judgment is far from being equally so; it is even quite good.

Let us introduce another senile dement, Mme. Langlais. She has the brusque, surly but good manner of a country woman.

She has lost her memory even more than Mme. Macolard but her judgment remains equally good. She has less dignity than Mme. Macolard and more good nature, more gayety, especially at the beginning of the sitting; as time goes on she changes as will be seen.

Q. What is your name?

A. My name is—I have forgotten it already—I have forgotten it. I was born at Sucy—there—

Q. You do not remember your name?

A. Ah! to be sure—the name of course. I know well, only at times one does not pay attention. I was born at Sucy.

Q. You do not know your name?

A. Yes, monsieur.

Q. What is your name?

A. Augustine.

Q. And your family name?

A. My family—Oh, that's at Sucy.

Q. But your family name.

A. I have forgotten, I have forgotten.

We have never encountered a more complete case of amnesia.

Q. What is your age?

A. Ah! monsieur I am old. I cannot always remember.

Q. Is it morning or evening?

A. I cannot tell you. I do not know, I do not know if it is morning or evening. I do not know, I cannot tell you.

Notice the tone, the gay manner.

Q. What is a fork?

A. Monsieur?

Q. What is a fork?

A. What is a fork. Well it is—no. I cannot say what it is—A fork is a fork—so—to eat with.

Q. What is a table?

A. A table? Well a table, it is to be useful for—Well I cannot tell you any better.

Q. A chair?

A. Well a chair, it is useful for—well, to sit down.

Q. A horse?

A. Ah! well, faith, a horse, to work—to work. And then. I don't know how to do any more.

Q. And a mama?

A. (She laughs.) Ah! That, she does all sorts of things.

Q. What? What's that?

A. Yes, it is a marmot, a fichu, it is all sorts of things, and then one puts—

Q. Where is your nose?

A. (First she laughs because she seems surprised and struck with the unusual character of the question. This proves in itself that the judgment is good.) Well, here it is, my nose—here Monsieur, it is here—It is large but here it is all the same. (And as we laugh at her remark she adds) Faith, you make me say silly things!

Q. Now you are going to repeat some figures that I give you.

A. Yes, sir.

Q. 2!

A. 2 what?

Q. 2!

A. 2.

Q. 4, 9!

A. (Silence.)

Q. 4, 9!

A. 4, 9!

Q. 6, 1, 8!

A. How is that? I forget. Ah! when one is old.

Q. 3, 0, 7!

A. Oh! well, I cannot tell you that, like that.

Q. You know. 2!

A. 2!

Q. Wait!

A. Well, I do not know.

Q. 3, 0, 8!

Q. Oh! well, there is too much. There was 3 and then—Must I say that? I have no more memory, nothing of anything. My, but it is provoking!

She is right, her memory has become very weak; but she criticizes herself, she accuses her age!

Q. What is this house here?

A. Yes, monsieur.

Q. What is this house here?

A. Well, what do you want? I have the name, but I have forgotten. It is provoking, the least thing.

Q. Is it a castle?

A. Yes, it is a castle, but it is not ours.

Q. Here, is it a prison?

A. Ah! no, it is not a prison.

Q. A hospital?

A. Yes, a little farther—They call that—(She stops, not finding the word). What do you wish since I tell you I do not know anything about anything.

There is a little confusion in her words because she has verbal amnesia and cannot find her words easily.

Q. What is this? (Showing a key.)

A. A key.

Q. And that? ("crayon"—a pencil.)

A. (After having looked closely.) A "corroy"—No, I see all right what it is—a "crochon"—No, I tell you I am stupid as anything.

Q. What is it?

A. I see a pencil—Ah! what do you want? I cannot see well.

Q. And this? (A sou.)

A. Oh! that, well, think, that is a 2-sou piece.

She has the same trouble with the colors; she names correctly yellow, blue, and green; the red embarrasses her.

A. That, it is a—It is a thing—How now? I see, I know, I cannot say it—It is violet—not violet—I cannot say it. Oh how tiresome! It is garnet.

Q. How many children have you had?

A. Yes.

Q. How many children have you had?

A. I have had four.

Q. No more?

A. Really, I don't know if there are others. Faith, when they're all gone—I don't know.

Q. What are their names?

A. My boy, he is the oldest. He is good in business, but the others— They do not know. (Sighing) Ah! mon Dieu, mon Dieu, I am half dead. It is unfortunate when one cannot see! (She constantly complains of her eyes.)

A moment later admitting that she gets confused when she is told to count thirteen sous she makes this picturesque reflection; "My grandmother used to say to me when you are old you will see—And now here I am." We pass on to other tests which we make, in order to get her level; because of her amnesia we can accomplish nothing; suffice it to say that she reaches only the level of intelligence of four years.

At the moment of parting we thought of a little by-play which shows very well that this old woman has good sense and can defend herself from our suggestions. The attendant came to bring a basket of apples into the office; the apples were red and had an appetizing appearance. We said to Mme. Langlais,

Q. Here are apples. Take one.

A. No. I don't want to.

Q. Oh! yes, take one.

A. No, they are not mine. So people can say that I took the apples. (With energy) When I eat apples it is because I buy them.

Q. But he (pointing to the other) he stole the apples.

A. Ah! that, that's not my affair.

Q. Take one!

A. There is no danger. I do not want to take other people's. If any one gives them to me I will take them. But I do not wish to take them. There!

This was the first skirmish and we already see that she can defend herself against temptation. But here is something better, the scene which follows indeed astonished us. We were not prepared for this conduct on the part of a woman whom amnesia had driven to forgetting her own name. We simulated wishing to borrow money from her.

Q. (With an insinuating tone) I need some money.

A. (Without disturbing herself, remaining seated) Very well, every-

body needs that. But you understand that if I were to come and hunt for twenty sous, somebody would have to give it to me. One must eat.

This is the nonsense of asphasia. Let us continue.

Q. But I need money.

A. Me too—Faith!

Q. I am going to write a note for you to give me money.

A. No, monsieur, I have no money for that.

Q. (Taking a pen) I am going to write a note for you to give me money.

A. I have none; I cannot give you any.

Q. One always has money.

A. I should like to know, I who am all alone.

Q. (Writing) I write, Mme. Langlais will give me ten francs.

A. (Raising her voice) No, no, no. I cannot give money to anybody. I have none. Well, my husband left me well fixed. No I won't give any of it. With that the merchants are very kind.

Q. (Showing the note) Very well I have made the note for ten francs. You will sign it.

A. No, no, Monsieur, I have none, no money.

Q. Come on, sign this.

A. No, no, I cannot! I have no money. I am all alone (indignant). And then, I must! If I earn twenty sous and I eat at the same time, I would have nothing, no, I cannot.

Q. See here! Madame Langlais, you must sign.

A. No, I cannot! I cannot give money when I have none. (She is angry, she wheels in her chair and turns her back to us) And my son, he would fix me. He would say you are indeed crazy! I have not worked all winter.

Q. Give me ten francs because I want to buy a bicycle.

A. Well, yes, I do not say no, but I have no money. You understand, a woman who works. If I had I might say I have some.

Q. I need it for a wedding.

A. To go to a wedding! You have more than I. You earn more than I. I cannot, I cannot.

Q. Have you much of a fortune?

A. (Indignant) I have the money that I earn.

Q. About how much have you?

A. I don't need to tell you what I have. You have more than I. You understand, a woman of my age cannot have much.

Q. But you have a house?

A. And if I had a house it wouldn't be for you!

Q. You must have money in an old drawer.

A. And if I had I wouldn't give it to you. My dear friend, if you have only that—

Q. (Insinuatingly) Shall I write to your son for him to give me your money?

A. (Furious) Well, well, well—There are children—If there is a 20-franc piece, and he were to give it—Money, I have none nor my son either.

Q. I assure you I need money because I love delicate food.

A. Well, we eat potatoes with oil and vinegar. I eat that and it is good. Since I came I have had nothing at all.

Q. (Without saying a word we hand her the pen.)

A. No, I have no money at all.

In her indignation she rises and walks about the room while we both remain seated at the table. Her countenance is animated. She pronounces her words indistinctly. She encounters the basket of apples, she takes one and tries to break it while saying words like this, "No, I have no money for anyone." We offer to help her cut her apple. She refuses. "A woman all alone!" she scolds. "What money can she have! a woman all alone." She seats herself apart and eats her apple with a surly air all the time repeating the same words. Time passes; already ten minutes have elapsed since she took the apple but her anger does not leave her. That demand for money is always on her heart. She talks to herself about it constantly. Finally the one of us who had conducted the dialogue (Binet) leaves the room and she draws close to Dr. Simon and says to him under her breath, "Who is that man there? I cannot—I have only just enough for myself. No I will not! My husband would scold me. I don't want to be tormented like that! If Louis came he would lead me such a life—Why——" Her grudge is so strong that when B—— returns to the room the dement refuses to speak to him; we insist upon photographing her. She refuses obstinately. She continues to dig in the basket for apples and to crunch them. We wish to call her attention to the fact that the apples do not belong to her.

Q. Where did you buy that apple?

A. It was given to me.

Q. Who gave you that apple?

A. That is not your affair.

Q. See here, where did you get that apple?

A. There are more in the field.

Q. But you did not go into the field to get it?

A. That is nothing to you. It came from the field.

Q. Did you steal it?

A. That's none of your affair. Why no. Why do you come asking me that? I ask you a little—There, who is going to ask me? (She takes another apple.)

Q. Apples cost four sous.

A. That's none of your affairs.

Q. It is worth four sous.

A. It isn't yours.

Impossible to talk any more with her, she has become intractable; we are obliged to let her go. An attendant comes and gets her and takes her to the hall.

This curious scene lasts for nearly three-quarters of an hour. There was not a moment of forgetfulness. The patient never for an instant forgot that her money was wanted; her anger increased steadily in a sort of classical manner first restrained by a feeling of propriety then overflowing, allowing such remarks as "That's none of your affairs" and ending in a calmer state of persistent rancor against the one who attempted to take her money. It is really interesting to see such a continuity of thought in a patient suffering from profound amnesia.

2. COMPARISON BETWEEN SENILE DEMENTIA AND PARALYTIC DEMENTIA. It remains for us to draw from these two observations of senile dementia a conclusion relative to the theory of dementia in general.

Senile dementia has been judged from very different points of view. In the first place one has been so deceived by the incoherence of their words that it has been supposed that they had incoherence of ideas, or delirium; let us recall in this connection the contradictory replies which the old women gave of the age of their mothers and the number of their children. A more exact interpretation has shown that in this case the incoherence is more apparent than real; it indicates disturbance of language, the unconscious use of inexact words and this paraphrasing is only one of the many manifestations of a more considerable disturbance of memory. Senile dementes present in reality the characteristic trait of having become incapable of remembering; they have lost the faculty of evocation and of fixation, so far as it can be lost. For proof of this we need nothing more than the game with the cards described above which, indeed, gives positive results only with patients of this category.

If senile dementes are especially affected in the evocation of their memories, is it right to say that we should compare them to general paralytics, since we have admitted that with the latter the impotence of evocation gives the key to all or nearly all of their disturbances of functioning? No, this comparison would not be cor-

rect, because when one talks with senile demented one notes this extremely important fact that they have good sense and are conscious of their sorry state of decay, which contrasts clearly with the unconsciousness which marks most general paralytics. Moreover, for a long time it has been acknowledged that the difference between the two forms of dementia lies in the fact that in senile dementia the judgment is better preserved than in paralytic dementia.

We admit this point of view without hesitation, but we believe it important to emphasize the psychological consequences which proceed from this because these consequences so far have not been pointed out. If it is true, as we believe, that senile demented are not lacking in good sense or in judgment, this makes the mental nature of judgment appear in a new light.

Our classical theories, which constantly put the accent on the clearest and most conscious part of the mental processes, the idea, which admit that the intelligence is a combination of ideas, and that the law of the intelligence is a logical law, these theories, we say, consider the judgment also as an ideational manifestation, as an act which consists in grasping the relation of two ideas, in uniting them, or in opposing them. If it were really so, the facts of pathological observation which we have just reported could not be understood. One who was incapable of having ideas would be incapable of judging; and our two poor old women who are able to recall almost nothing in the form of words or images could neither judge nor appreciate. How would Mme. Macolard ever have come to judge the laughter of the imbecile Denise as childish and unmannerly if it had been necessary for her to represent to herself under the form of ideas the attitude of good manners?

We much more readily believe that the act of judging consists essentially in an emotive and motor tendency to approve and to disapprove; this tendency may indeed manifest itself by ideas which are the motifs of judgment; but often the ideas do not form themselves clearly after the judgment is pronounced, and often they are so slow in forming themselves that they never appear; one judges without motif, without justification, without ideas, but nevertheless, one judges. At the moment of judging one is animated by a certain feeling which draws one towards or turns one from the object judged. It is this feeling which is

the foundation of the matter. The painter, to whom one submits a canvas, says, "That is no good," but he can not always express clearly what is "no good;" he has the feeling, and this feeling is often as strong, as imperious, as irresistible as the most clearly deduced reasoning. In the same way one may have the feeling that an action is impossible, or that a certain course is unreasonable, or that a certain expression is immoral, and one disapproves because he is animated by a certain feeling of disapprobation without having a single clear idea, without attempting to give any justification, without referring to a norm of things possible, reasonable or moral.

We might even go farther. One could insist that there are certain acts of judgment, that are performed only by ideas, which are the simulations of judgment rather than real judgments. One submits an action to a person for his judgment; if that person possesses the instinctive part of judgment he will exclaim, "But that is crazy, that is idiotic, etc." Exactly as another to whom we present a foreign food after having put it in his mouth exclaims, "That nauseates me." On the contrary, one who has not this instinctive reaction is obliged to compare the act submitted to him with the memory of other similar acts and to recall to himself if in analogous circumstances the action has been generally disapproved, has appeared ridiculous or imprudent; thus he makes a comparison, an appreciation by means of a norm which is furnished to him by his experience. This diverted process is, we believe, the rock of salvation for those who have no judgment and who endeavor, nevertheless, not to be deceived. This certainly is not to say that the judgment by ideas is always false or bad, but in itself it is rather empty and very subject to errors in the same way that judgment by instinct is very narrow; the true judgment is a synthesis which includes at the same time both feeling and idea.

Let us conclude by a little psychological experiment which throws a clear light upon the important rôle of feeling in judgment. Suppose that some one writes before us a list of one hundred common words, like duck, hat, meadow, etc.; we have read them over so as to practically know them. Now the list is hidden; we are given a word at random, and we must reply as to whether or not it is in the list. The necessary time for judging varies a little, according to the case, according to the word, accord-

ing to the persons who serve as subjects and a host of other circumstances impossible to evaluate; but on the average the time is very short. Two or three seconds suffice to decide whether the word is new or known. Now two or three seconds is not sufficient to recapitulate, even mentally, the list of one hundred words and, moreover, the testimony of the subjects is that they never make the mental recapitulation; they do not make it because they do not feel the need of it. One passes judgment upon the word whether it is new or known according to a particular feeling which is awakened by the audition, a feeling of novelty, of surprise if it is unknown; a feeling of having been already seen, of familiarity, in the contrary case. Here then is a case of an act of judgment, very clear, very easy to analyse, which would require, if one conformed to the rules of logic, a detailed comparison with images or perceptions, but which in reality disregards all this, is nothing less than intellectual, and is produced by the wholly instinctive operation of feeling.

This is the point to which reflection upon the results of our experimental psychology leads us. These results are confirmed by the results of pathological psychology. We have just seen two old women who have a remarkable poverty of ideas and who often show a positive inability for evoking the proper idea; in spite of this they judge and they judge exceedingly well. By their attitudes they show that they have preserved their feeling of propriety; by the way in which they refuse to reply haphazard to what they do not know they prove that they have the feeling of true and false; certain ones have also in the most touching manner the painful feeling of their own decay and are sorrowful over the effects of old age; often they have also the consciousness of being in a hospital. We have seen in Mme. Macolard the feeling of disapprobation for the puerile laughter of an imbecile. Even at our own expense we have learned how much Mme. Langlais judges the danger of putting her signature to a note, because she never pardoned the proposition which we made to her of borrowing ten francs.

All these judgments are the indications of a character which in spite of amnesia is not yet disorganized; thus in the presence of a senile dement one has the clear impression that there is before him a personality that holds itself together and not one that is amorphous.

In terminating this point let us harmonize these conclusions with those acquired from another study which we made upon the relation of speech and thought. We have seen that there are thoughts without images even among normal adults who are in full possession of themselves, because it was among them that we made this unexpected observation, they are able to have an image and to think far beyond this image, to think things very much more complicated which the images can not represent.¹³

We have further seen that there are some thoughts without words; we have found the proof of this among imbeciles and cases of aphasia.¹⁴ What remains of a thought from which its two principal elements consciousness and analysis have been removed? We have shown that there remains a particular tendency, which manifests itself under the form of an indefinable feeling. One has the feeling of an intention. We now extend this theory to judgment and it certainly does not require a great effort of the imagination to make such an extension because to think is to judge, and what is true of thought in general must be equally true of judgment. In every thought there is an appreciation and this appreciation is a judgment. We have besides direct proof that this theory is true of judgment, because we have just seen that patients afflicted with amnesia, incapable of recalling the vast majority of their memories, can nevertheless continue to judge correctly. They have had the experience and they retain good sense and a critical mind, even though they can no longer evoke the precise memories of their experiences nor cite the least fact; in the place of precise memories they have the feeling of things, and that suffices; it amounts to the same thing, it permits them to make a judgment.

According to our hypothesis the feeling presents itself in a definite relation to the idea. Idea and feeling make one; they are two successive stages of the same process; that which is idea was

¹³ Thus a persons who thinks, "I shall leave tomorrow," may indeed have images of the train, the trunks, the country he is leaving, the friends who expect him, and of all sorts of other details; but these are only details, and the essential idea, "I shall leave tomorrow," does not and can not figure in these images.

¹⁴ Let us recall the observation of that aphasic patient who when asked a thing too difficult for him replied in an energetic, slow tone, "Ça, non" that is to say, "I can not do that;" he had then a thought without adequate words, and consequently some part of the thought without any words.

at first a feeling and the feeling in evolving and rendering itself precise becomes at the same time idea, word, action; the feeling is the obscure, heated stage; when it clears it becomes more comprehensible and rational, it produces ideas. In senile dementia it is the last part, the flower of the process as it were, the idea that is struck and withers; but the instinctive part remains vivid; and it is thus that senile demented are reduced to an instinctive existence consequently very low, very animal, but still coördinate. Let us recall in this relation our scheme of thought which consists in a triple phenomenon of direction, adaptation and control. It now appears to us that it is not only the control which can occur under the form of feeling, but also the direction, since senile demented in spite of their amnesia know how to keep a given direction and a prolonged attitude. Moreover, we can no longer be content with the conclusion that in senile dementia there is a conservation of the judgment; we go farther even to the much more interesting and more profound conclusion that senile dementia tends toward a destruction of the ideational life with conservation of the instinctive part of the thought.

Certainly this word instinct is one which has been most seriously and most dangerously abused; and perhaps one would not find two psychologists or two naturalists who would give the same definition of instinct. It is therefore perhaps dangerous to introduce this word of equivocal meaning into a new analysis of the phenomena of intelligence. Nevertheless, in spite of all these objections, in terminating this study of senile dementia we have decided to present a proposition relative to the distinction to be established between *ideational* intelligence, which as its name indicates operates by means of ideas and of words, and *instinctive* intelligence; the latter evidently has nothing whatever to do with certain characteristics which rightly or wrongly are attributed to the instinct of animals, when one wishes, chiefly for theoretical reasons, to make a distinction between instinct and reason; we do not in the least attribute to that which we call "instinctive intelligence" the qualities of innateness, infallibility, specificity, imperfectibility, necessity. A single character, a character wholly negative, without doubt the most important character of instinct, is found in the instinctive manifestation of the intelligence; that is, it is the lack of an exact image picturing the end to be attained and the means to be employed, which would give

to all this a clear awareness. There is here the lack of a logical perception, of a verbal reasoning, which would permit of explaining and of demonstrating a succession of truths; it is, in a word, in the realm of the unknown and the mysterious, surrounding actions which are none the less adapted and intelligent in their effects.

Let us go back and compare our two senile demented with our general paralytics. It has long been said that judgment remains in senile dementia but is lost in paralytic dementia. This truth is open to criticism when affirmed in such absolute terms; because it is possible to find some traces of judgment among general paralytics who are at the beginning of their malady; there are others, quite advanced in certain symptoms, who still retain a certain amount of good sense. We have drawn at some length the portrait of Mme. Solas, a paralytic who passed judgment upon herself and found herself very stupid. One could not have said of her that paralytic dementia always destroys the judgment. To avoid these contradictions one must take into account the fundamental idea of level. Without doubt at a given level the general paralytic has infinitely less judgment than the senile demented. Mme. Langlais has an intelligence of scarcely four years; the paralytics of seven or eight years judge much less correctly than she and have consequently very much less common sense.

Here is an incident in proof of this. Some pages back we spoke of the anger of Mme. Langlais whom we requested to sign a note for ten francs. It is well known that paralytics on the contrary are very generous and would give away millions when delirious. But even apart from all delirium one very easily obtains from many of them gifts by writing. When Mme. Langlais left us we had the curiosity to call into the office a general paralytic whom we knew very well, a woman named Bernard, and to demand money of her in a similar manner. The reception was altogether different.

This woman has a level of seven years.

Q. (Writing) Mme. Bernard, have you a little money?

A. None.

Q. But one always has a little money.

A. I had some money once.

Q. You see, I need some money.

A. Ah! ah! ah! I also need some, and I shall have some money.

Q. How much have you?

A. A good deal of money.

Q. A million?

A. Oh! no, more than that; not a million, no, no.

Not very clear; her replies seem contradictory.

Q. I need some money. I wish you would sign a note for me.

A. (By no means offended) Ah! Yes, a note.

Q. (Writing) Your name is Mme. Bernard?

A. That was my maiden name.

Q. And your married name?

A. Mme. Dubos.

Q. Now you are going to sign this? Mme. Bernard will give 100 francs to M. François.

A. Ah! yes. (She laughs and signs.)

Q. So you will give me 100 francs?

A. (Without the least concern) I have 800 francs I can get, 20 francs, one glass.

Thus it is extremely easy to obtain the signature of Mme. Bernard. To make her laugh a little and terminate the scene we risk a pleasantry, but she does not understand it.

Q. In order that your debt may be altogether serious, I am going to make you swear upon the tail of a cow.

A. (Seriously) Ah! there are cows at Partenay. (Her native city.)

This has only the value of an anecdote. We cite it merely to establish a striking contrast from the point of view of feeling between the woman Langlais, the senile dement who has a level of four years, and the woman Bernard, paralytic dement who has a level of seven years. While the former so easily evokes feelings which prevent her from loaning the money, the latter evokes nothing, lets things go, remains indifferent. This state of indifference by the way is very remarkable with general paralytics; and we suppose that their indifference must be attributed to troubles of functioning. They still possess the necessary feeling but they cannot evoke it, their difficulties of evocation bear therefore at the same time upon their feelings and upon their ideas.

But in order for this thesis to be quite clear it must be limited and defined by several remarks. It does not seem that general paralytics have wholly lost the faculty of being emotionally aroused. Such an affirmation would be opposed to every day observation. They are patients that under many circumstances show themselves very emotional. It is easy to anger them, easy

to make them weep. We recall a woman with the level of nine years to whom we said, by way of experiment, that they never gave the patients anything to eat at the hospital which she had just entered. Immediately she burst into tears like a child. It proved to be also the grief of a child which did not last long and which was easily consoled. Inside of three minutes we took the



FIG. 24. MME. POIRE; GENERAL PARALYTIC; INTELLECTUAL LEVEL OF NINE YEARS. WE HAVE JUST ANNOUNCED TO HER THAT AT THE HOSPITAL THEY NEVER EAT. THE PATIENT AT THIS NEWS BEGINS TO CRY.

two photographs with contrary expressions. The emotions of these patients seem to us to lack continuity; they can be intense but they do not last long. Moreover they are incongruous and are often followed by states which are quite incompatible with them. We have seen an example of this in Ramonot, who said to us all in the same minute when we were conjecturing a certain event, sad for her, "I would weep," then "I would laugh." In a word it is only the simplest, the most rudimentary feelings

which manifest themselves among general paralytics. There is a complete hierarchy in the emotional life. The so-called intellectual sentiments, those which form the substance of judgment, occupy the most elevated part of the scale; feelings of propriety, truth, probability, justice, are among those which are lost in the general paralytic. Thus the paralytic appears to us like a being



FIG. 25. TWO MINUTES LATER WE ASSURE MME. POIRE THAT IT WAS A JOKE; SHE AT ONCE RESUMES HER SMILE OF SATISFACTION.

whose personality is profoundly disturbed; if one compares a paralytic with a senile dement, both having the level of four years, one has the impression that in the case of the senile dement he is in the presence of somebody while with the paralytic there is no longer anybody.

CONCLUSION

As much to close this study as to begin others, we terminate by summing up whatever our experiments and reflections have taught us as essential in the psychology of senile and paralytic dementia. It will mark a stage of the journey for later works.

These two forms of dementia correspond to a lowering of intelligence which is measurable, as we have seen; from this comes the practical conclusion that demented are unable to adapt themselves any longer to the ordinary condition of life and have need of the simpler life of the hospital. There is here, of course, a commonplace phenomenon which is to be found in a great number of forms of insanity and can characterise none, because it is almost an absolute rule that the insane undergo a lowering of level.

Second, traits more important than the preceding, senile and paralytic dementia belong to the category of deficient mental states; let us understand by that that these mental states separate themselves from the normal not by the addition of certain positive symptoms, which would constitute originality, but rather by the absence, the gap, the weakness of certain integral parts of the normal mechanism. From this point of view, the insanities resemble the original states of idiocy, imbecility and morosity, which constitute also the states frankly defective.

Only, that which is a loss among demented is a lack of acquisition among defectives. The difference between the one and the other is that the one is inertia of functioning and the other an insufficiency of development; this was already known or at least suspected; our work has especially consisted in putting precision into the statement and in filling out formulas that were rather empty. We know now that the inertia of functioning consists in a weakness of the evocation of the states of consciousness and that the lack of development is manifested in the quality of the states of consciousness which are not sufficiently differentiated. These few words sum up a considerable experience to which one must

return in order to appreciate its value and which can serve the clinician for the diagnosis of embarrassing cases.¹⁵

Here then is what we have learned about the intimate nature of dementia; we know how to distinguish it from original defectiveness; we do not distinguish it by means of incidents but by its characteristic form. It remains now to complete the comparison of dementia with other insane states. This comparison, if we sometime have the time and the means to pursue it, will permit us better to understand dementia, because by multiplying the points of comparison we make the study more profound. It will permit us especially to prolong our analysis of alienation. Since the study of imbeciles has enabled us to know demented, it is to be hoped that the study of demented, in their turn, will enable us to comprehend confusional states and delirium. In a well ordered sequence of works the results acquired facilitate the subsequent conquests, just as a stone placed in an edifice serves as a base for new stones.

ALFRED BINET AND TH. SIMON.

¹⁵ It will be noted that we seem in all our study to have considered the weakness of evocation as a most important fact; it is a most important fact for the present article in which we are obliged to limit ourselves; but we are far from thinking that this should be a most important fact for psychological explanations, and especially for physiological explanations. Only there should be an agreement as to the value and the import of certain physiological explanations. Since Mathias Duval, some neurologists, some alienists have believed that they could explain a host of psychic phenomena, anaesthesia, amnesia, delirium, by supposing that these phenomena were due to the fact that some cerebral neurones had been severed from their communications. These are surely suppositions too convenient; they explain everything and consequently explain nothing. We refuse to explain in this manner the failure of evocation met with in demented. For the same reason we shall not state the very vague ideas that have been expressed on psychological phenomena considered as forces, which have been ingeniously described as a nerve force, a tension, a flow, a latent energy, comparing them to the physical force engendered by a reservoir full of water. It would be easy to apply these notions to the mental state of demented, and to say that their psychic processes are lacking in nerve force or in tension. But what is the use? Without conjecturing what the future may teach us about cerebral dynamics, we can say that for the present these are only metaphors.

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